LITTLE TOR SUBSTATION

Town of Clarkstown, Rockland County, New York

FINAL ENVIRONMENTAL IMPACT STATEMENT

Volume II
Appendices

Applicant:

Orange & Rockland
a conEdison, Inc. company

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Prepared: February 2014
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VOLUME II - APPENDICES

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Transformer Fluid Mobility Study

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Memorandum

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To: Chuck Utschig

From: Elana Seelman
Steve Ciambruschini

Info: Terrance Stanley

Date: 14 February 2014

Re: Evaluation of Transformer Fluid Mobility
Little Tor Substation
New City, NY
Langan Project No.: 190011601

Langan Engineering, Environmental, Surveying and Landscape Architecture, D.P.C. (Langan) has prepared this technical memorandum to document an assessment of mobility of transformer oil within the subsurface. The assessment included a seepage velocity calculation to determine potential impacts to receptors from the oil and an evaluation of the oil to determine the potential for dissolved-phase impacts in ground water.

PROJECT UNDERSTANDING

We understand that transformers will be installed within containment systems at the site. The transformers contain insoluble electrical insulating oil, similar in consistency to a vegetable oil. The primary component of this oil is naphthenic oil. The containment systems consist of gravel-filled basins surrounded by concrete walls and a bottom lining that consists of a geocomposite material that solidifies upon contact with oil. There is also a secondary containment consisting of raised curb around the entire station. Storm water within the station is directed towards a drainage structure that discharges to storm water basin that is lined with a geocomposite material that would also solidify upon contact with oil thereby blocking the drainage outlet.

The town is concerned that if a leak occurs in the transformer, the oil could reach ground water and potentially impact ground water receptors in the area.

IMPACTS FROM TRANSFORMER OIL

In order to assess potential impacts to receptors (wetlands and water supply wells), we modeled the transport of product within the subsurface using a seepage velocity calculation. The calculation used input parameters based on known site soil conditions, ground water elevations and characteristics of the oil. The model to calculate the estimated seepage velocity for naphthenic oil assumes 100% pore space saturation and thus a worst case scenario release.

The conceptual site model for a transformer spill shows the transformer oil migrating downward from the containment area through the unsaturated overburden soils to the ground

water table without reaching bedrock. The oil is lighter than water, so it would flow on top of the water table. Near receptors are wetlands, with the closest wetland approximately 140 feet from the substation, and the West Branch Hackensack River, approximately 200 feet from the substation.

The horizontal seepage velocity for electrical insulating oil was calculated to be 33.6 feet per year (ft/yr). The vertical seepage velocity for electrical insulating oil (see Table 2) was calculated to be 240 ft/yr (0.66 feet per day). Details on the properties and calculations for the seepage velocity assessment are provided in Attachment A.

Based on a 13-foot vertical distance to the ground water table and the distances to the receptors, the transformer oil would reach the nearest wetland in approximately 4.2 years from the time of discharge and the West Branch Hackensack River in approximately 6.0 years from the time of discharge.

DISSOLVED PHASE IMPACTS

The Material Safety Data Sheet (MSDS) for CrossTrans 206 oil, a typical electrical insulating oil, identifies the oil as a naphthenic oil that is insoluble in water. Naphthenic oil does not contain contaminants typically found in petroleum products, such as benzene, toluene, ethylbenzene, xylenes, or naphthalene. No compounds are present in this type of oil that would typically dissolve in water. Past experience at other sites with dielectric fluids, which are similar to the CrossTrans 206, reveals that these fluids do not readily dissolve into ground water and that the oil stays in a free phase.

CONCLUSIONS

In the case of a discharge of the transformer oil to the ground surface, the oil has the potential to migrate along the ground water surface. It is estimated that the oil could travel approximately 140 feet in 4.2 years and 200 feet 6.0 years. The potential for the oil to dissolve into the ground water is low based on the insolubility of the oil and the absence of soluble compounds within the oil. Therefore, if a discharge should occur, Orange and Rockland would have significant time to mitigate the discharge (via source removal) in a timely manner and the risk to the human health and the environment is minimal.

A T T A C H M E N T A

DETAILS ON THE PROPERTIES AND CALCULATIONS FOR THE SEEPAGE VELOCITY ASSESSMENT

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TRANSFORMER OIL MIGRATION MODEL

for

LITTLE TOR SUBSTATION
New City, New York

Prepared For:

Orange and Rockland Utilities, Inc.
390 West Route 59
Spring Valley, New York 10977-5300

Prepared By:

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February 2014
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LANGAN

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1.0 MODELING OBJECTIVE

The objective of the calculations is to generate a conservative prediction of how long it might take for transformer oil (electrical insulating oil) to reach potential receptors if a release were to occur.

2.0 MODELING APPROACH

The approach to assessing the potential migration of electrical insulating oil was to calculate its horizontal and vertical seepage velocities. With measured distances to potential receptors and seepage velocity estimates, the time it might take for electrical insulating oil to reach the receptors can be estimated.

The first step in calculating horizontal and vertical seepage velocities for electrical insulating oil was to estimate the intrinsic permeability of site soil based on its likely hydraulic conductivity. Intrinsic permeability is a fixed property of a soil, dependent upon its structure, not the fluid that moves through it. With an estimated intrinsic permeability of site soil and other parameters such as density, viscosity and temperature of the subject fluid (such as electrical insulating oil), the soil conductivity with respect to that fluid can be derived. With the soil conductivity estimate for electrical insulating oil, the horizontal and vertical seepage velocities were calculated.

Modeling assumptions are:

- All flow is under saturated conditions (pores filled with 100% electrical insulating oil).
- All flow is through homogeneous, unconsolidated overburden soils.
- The surface soils are horizontally isotropic.
- Flow conditions are steady-state.

The assumption of saturated conditions generates a conservative estimate of horizontal seepage velocity because in reality soil pore spaces do contain other fluids such as air and/or groundwater which reduce the ability of electrical insulating oil to migrate through pore spaces.

A conceptual cross-section depicting site conditions and electrical insulating oil seepage time estimates can be found in Figure 1.

3.0 INPUT PARAMETERS

Limited site specific geological and hydrogeological information is available for the substation location; therefore, representative properties were drawn from literature values judged to best approximate site conditions. The physical properties of groundwater and electrical insulating oil were also drawn from available literature.

3.1 Soil Intrinsic Permeability Input Parameters

- *Soil Hydraulic Conductivity* – (6 x 10^3 m/s; 54 ft/d) for poorly sorted fine to coarse sand with slight silt content from Argonne National Laboratory Table 5.4 http://web.ead.anl.gov/resrad/datacoll/conuct.htm. This soil description is a generalization drawn from logs of eight soil borings installed in and near the footprint of the proposed substation in 2007 to depths of up to 20 feet below grade.

- *Groundwater Temperature* - 11°C (52°F) (Figure 2) from United States Environmental Protection Agency at http://www.epa.gov/athens/learn2model/part-two/onsite/ex/jne_henrys_map.html

- *Groundwater Density* – 999.6 kg/m^3 at 11°C (Figure 3) from http://www.engineeringtoolbox.com/water-density-specific-weight-d_595.html

- *Groundwater Dynamic Viscosity* – 1.25 x 10^{-3} (N·s)/m^2 at 11°C (Figure 4) from http://www.engineeringtoolbox.com/water-dynamic-kinematic-viscosity-d_596.html

- *Acceleration of Gravity* – 9.81 m/s^2

3.2 Electrical Insulating Oil Horizontal Soil Conductivity

- *Electrical insulating oil Dynamic Viscosity* – 2.86 x 10^{-2} ((N·s)/m^2 at 11°C. The kinematic viscosity of electrical insulating oil is reported at various temperatures in Cross Oil Refining and Marketing, Inc. Electrical Insulating Oil Typical Properties dated 6/15/10 (http://www.crossoil.com/lib/docs/pds/CrossTrans206.pdf). Using these data, the kinematic viscosity of electrical insulating oil is estimated to be about 32 centistokes (Figure 5) which is equivalent to a dynamic viscosity of 28.61 centipoise or 2.86 x 10^{-2} (N·s)/m^2 at 11°C.

- *Electrical insulating oil Density* – 894 kg/m^3 at 15°C from Cross Oil Refining and Marketing, Inc. Electrical Insulating Oil Typical Properties dated 6/15/10 (http://www.crossoil.com/lib/docs/pds/CrossTrans206.pdf.

3.3 Vertical Seepage Velocity Input Parameters

- *Soil Effective Porosity* – 0.32 (unitless) for medium sand from McWorter and Sunada, 1977.

- *Soil Vertical Conductivity for Electrical Insulating Oil* – 0.0641 m/d which is 1/10th the calculated horizontal soil conductivity for electrical insulating oil of 0.641 m/d. Vertical hydraulic conductivity is typically less than horizontal by up to 1000 times (Anderson and Woessner, 1992) due to the stratified nature of soils. One tenth the horizontal value was selected for vertical conductivity.

- *Thickness of Soil Column Above Water Table / Depth to Water Table* – 3.96 meters below ground surface (13 feet below ground surface) from a July 2008 depth to water observation.

- *Difference in Electrical Insulating Oil Head at Ground Surface and Water Table* – 3.97 meters. Distance between theoretical surface pool of electrical insulating oil (assumed to be 1 cm thick) and depth of the observed water table.

3.4 Horizontal Seepage Velocity Input Parameters

- *Horizontal Hydraulic Gradient* – 0.014 (unitless). Groundwater elevation beneath the proposed substation was estimated by subtracting the observed depth to groundwater (13 feet) from the ground surface elevation at the southeast edge of the permanent swale (about 150 ft mean sea level). The resulting groundwater elevation estimate is 137 feet mean sea level. The water table elevation at the nearest wetland is assumed to equal grade, or about 135 feet mean sea level. The shortest distance from the permanent swale to the nearest receptor (designated wetland E in Figure III.E-1 of Orange and Rockland's Draft Environmental Impact Statement, April 22, 2011) is about 140 feet from the southeast edge of the swale. The horizontal hydraulic gradient used in this calculation is 0.014.

4.0 RESULTS

4.1 Horizontal Seepage Velocity

The calculated horizontal seepage velocity of electrical insulating oil is 0.09 ft/d. It would theoretically take about 1,520 days (4.16 years) for electrical insulating oil to migrate 140 feet from the southeast edge of the permanent swale to the nearest receptor (Table 1).

4.2 Vertical Seepage Velocity

The calculated vertical seepage velocity for electrical insulating oil is 0.66 ft/d. To migrate from the ground surface to a depth of 13 feet below grade (water table depth) would take 19.75 days (Table 2).

Total estimated travel time for electrical insulating oil from the ground surface to the nearest wetland is 1,540 days.

Table 1
Electrical Insulating Oil Horizontal Seepage Velocity Calculation
Little Tor Substation
Clarkstown, New York

Effective Soil Porosity	Soil Hydraulic Conductivity	Groundwater Density (11°C)	Groundwater Dynamic Viscosity (11°C)	Soil Intrinsic Permeability	Pore Phase Relative Permeability	Hydraulic Gradient	Electrical Insulating Oil Density (15°C)	Electrical Insulating Oil Dynamic Viscosity (11°C)		Horizontal Soil Hydraulic Conductivity for Electrical Insulating Oil	Corrected Electrical Insulating Oil Horizontal Conductivity		Electrical Insulating Oil Horizontal Specific Discharge		Electrical Insulating Oil Horizontal Seepage Velocity		
unitless	m/s	kg/m^3	$(N\cdot s)/m^2$	m^2	unitless	unitless	kg/m^3	cP	$(N\cdot s)/m^2$	m/d	m/d	ft/d	m/d	ft/d	m/d	ft/d	ft/yr
1	2	3	4	Calculated	5	6	7	8	Calculated	Calculated	9		Calculated		Calculated		
0.32	1.90E-04	999.6	1.25E-03	2.42E-11	100.0%	0.0140	894	28.61	2.86E-02	6.41E-01	6.41E-01	2.10	0.009	0.029	0.03	0.09	33.61

NOTES:
1 - Medium sand, McWorter and Sunada, 1977.
2 - Poorly sorted fine to coarse sand (6 x10^3 m/yr or 0.019 cm/sec)- http://web.ead.anl.gov/resrad/datacoll/conuct.htm
3 - http://www.engineeringtoolbox.com/water-density-specific-weight-d_595.html
4 - http://www.engineeringtoolbox.com/water-dynamic-kinematic-viscosity-d_596.html
5 - Assumed 100% pore space saturation with Electrical Insulating Oil.
6 - Estimated using depth to water of 13 feet and grade of 149 ft; Δy = 1 foot. Distance to Hackensack River is about 200 feet (Δx).
7 - Electrical insulating oil from Crosstrans 206 Typical Properties rev6/15/10
8 - Electrical insulating oil from Crosstrans 206 Typical Properties rev6/15/10
9 - Horizontal hydraulic conductivity corrected for pore space saturtion with electrical insulating oil. In this case no correction is need because 100% of pore space is electrical insulating oil.
Groundwater temperature estimated as 52°F (11°C) from Average Shallow Groundwater Temperature in the United States (http://www.epa.gov/athens/learn2model/part-two/onsite/ex/jne_henrys_map.html)
Accelaration of gravity = 9.81 m/s^2
$(N\cdot s)/m^2$ = Newton-seconds per square meter
cP = centipoise
kg = kilogram
m = meter
s = second
d = day
yr = year

The intrinsic permeability of the soil was estimated using the following equation:

$$k_{soil} = \frac{K_W \mu_W}{\rho_W g}$$

where,
k_{soil} = permeability of soil
K_w = hydraulic conductivity of groundwater for fill horizon
μ_w = dynamic viscosity of water
p_w = density of water
g = gravity
This equation is from: American Petroleum Institute, 1999. Free-Product Recovery of Petroleum Hydrocarbon Liquids, Publication Number 4682. American Petroleum Institute.

The horizontal seepage velocity through soil was estimated using the following equation:

$$V_x = \frac{K_{CT} \cdot i}{n_e}$$

Where,
V_x = horizontal seepage velocity
n_e = effective porosity
KCT = Horizontal soil conductivity with respect to electrical insulating oil
i = horizontal hydraulic gradient
This equation is from: Fetter, C.W. 1992, Applied Hydrogeology, Second Edition. Macmillan Publishing Company.

Table 2
Electrical Insulating Oil Vertical Travel Time Calculation
Little Tor Substation
Clarkstown, New York

Effective Soil Porosity	Electrical Insulating Oil Vertical Soil Conductivity	Soil Column Thickness Above Water Table	Vertical Head Change in Electrical Insulating Oil	Travel Time to Water Table Depth	Electrical Insulating Oil Vertical Seepage Velocity	
unitless	m/d	m	m	days	m/d	ft/d
1	2	3	4	Calculated		
0.32	6.40E-02	3.96	3.97	19.75	0.20	0.66

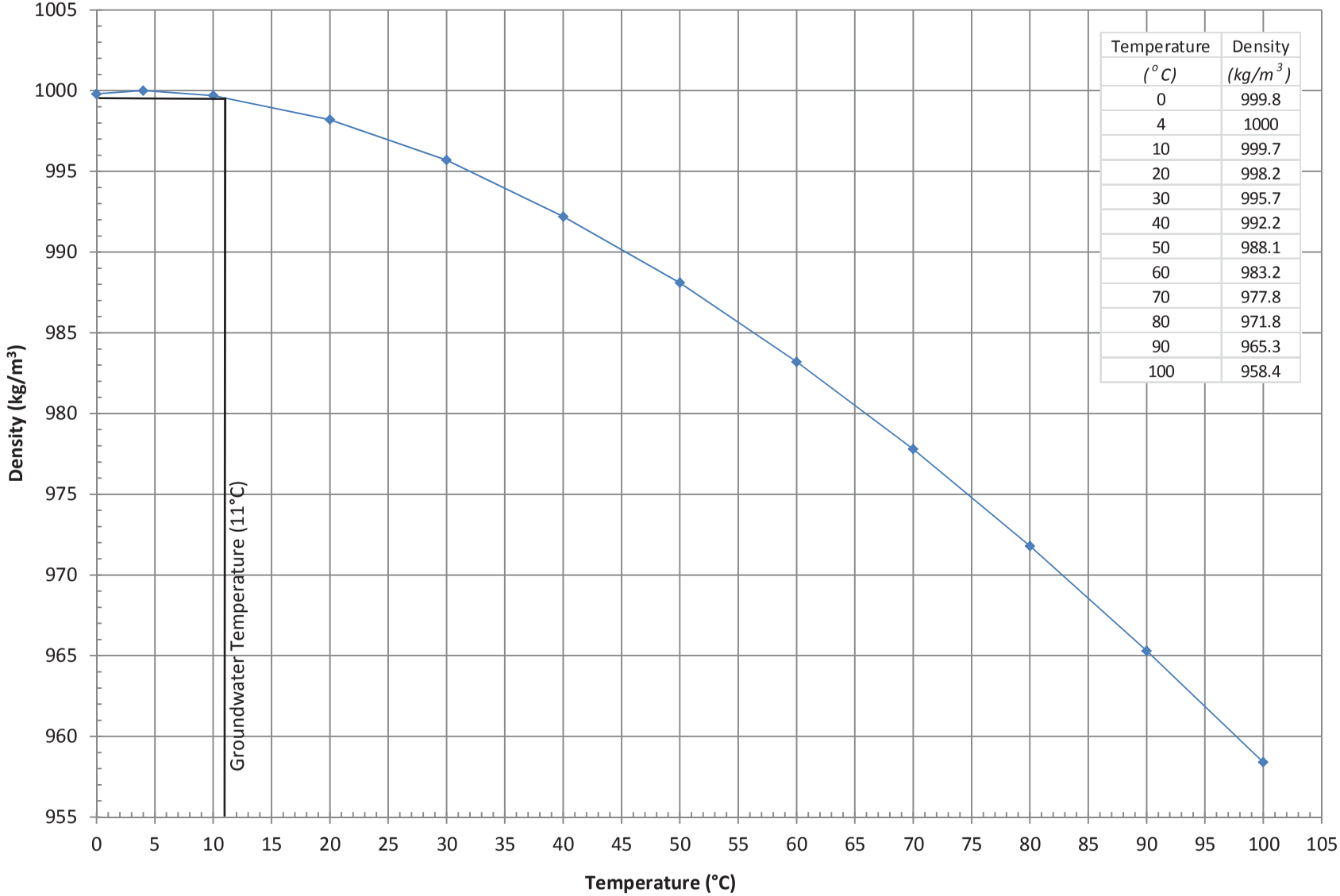
NOTES:
1 - Medium sand, McWorter and Sunada, 1977.
2 - Estimated to be 1/10th electrical insulating oil horizontal conductivity.
3 - Depth to water table estimated to be about 13 feet (3.96 meters).
4 - Electrical insulating oil vertical head change between a theoretical surface pool (estimated to be 1 cm thick) and water table at a depth of 3.96 meters below grade.
5 - Vertical travel time equation from Leidy & Taylor, 1992. Overview of Susceptibility of Aquifers to Contamination, Union County, Arkansas.
m = meter
d = day
ft = foot
yr = year

The vertical seepage velocity through soil was estimated using the following equation:

$$T_v = \frac{n_e \cdot b^2}{K_{CT} \cdot \Delta h}$$

Where,
T_v = vertical travel time
n_e = effective porosity
b = soil column thickness above water table
K_{CT} = vertical soil conductivity with respect to electrical insulating oil
Δh = change in vertical head of electrical insulating oil
This equation is from: Leidy, V. A.; Taylor, R. E. 1992. Overview of Susceptibility of Aquifers to Contamination, Union County, Arkansas. 1992, USGS Water-Resources Investigations Report: 92-4094

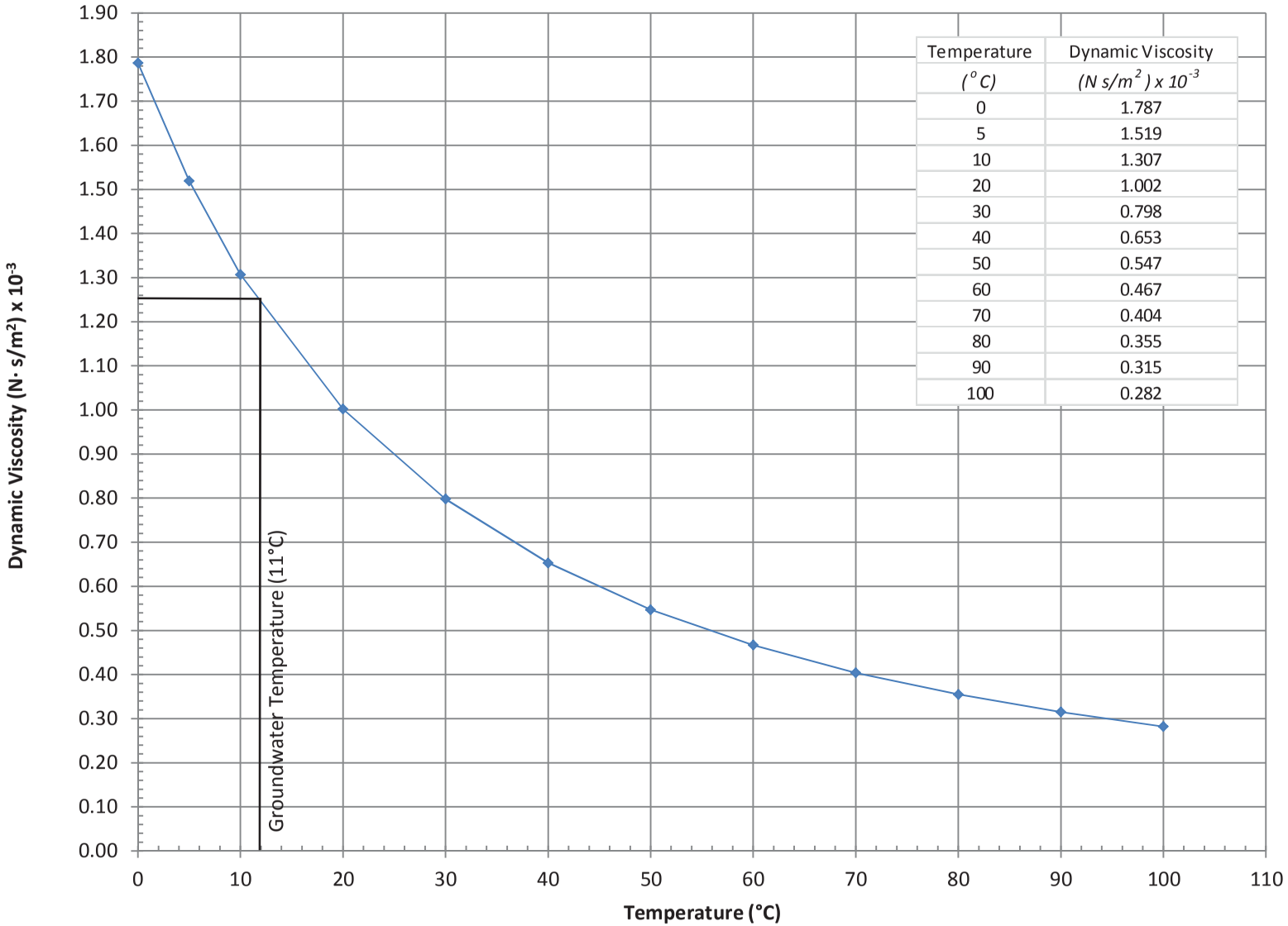
Figure 3
Groundwater Density



Temperature (^{o}C)	Density (kg/m^{3})
0	999.8
4	1000
10	999.7
20	998.2
30	995.7
40	992.2
50	988.1
60	983.2
70	977.8
80	971.8
90	965.3
100	958.4

Data from www.engineeringtoolbox.com

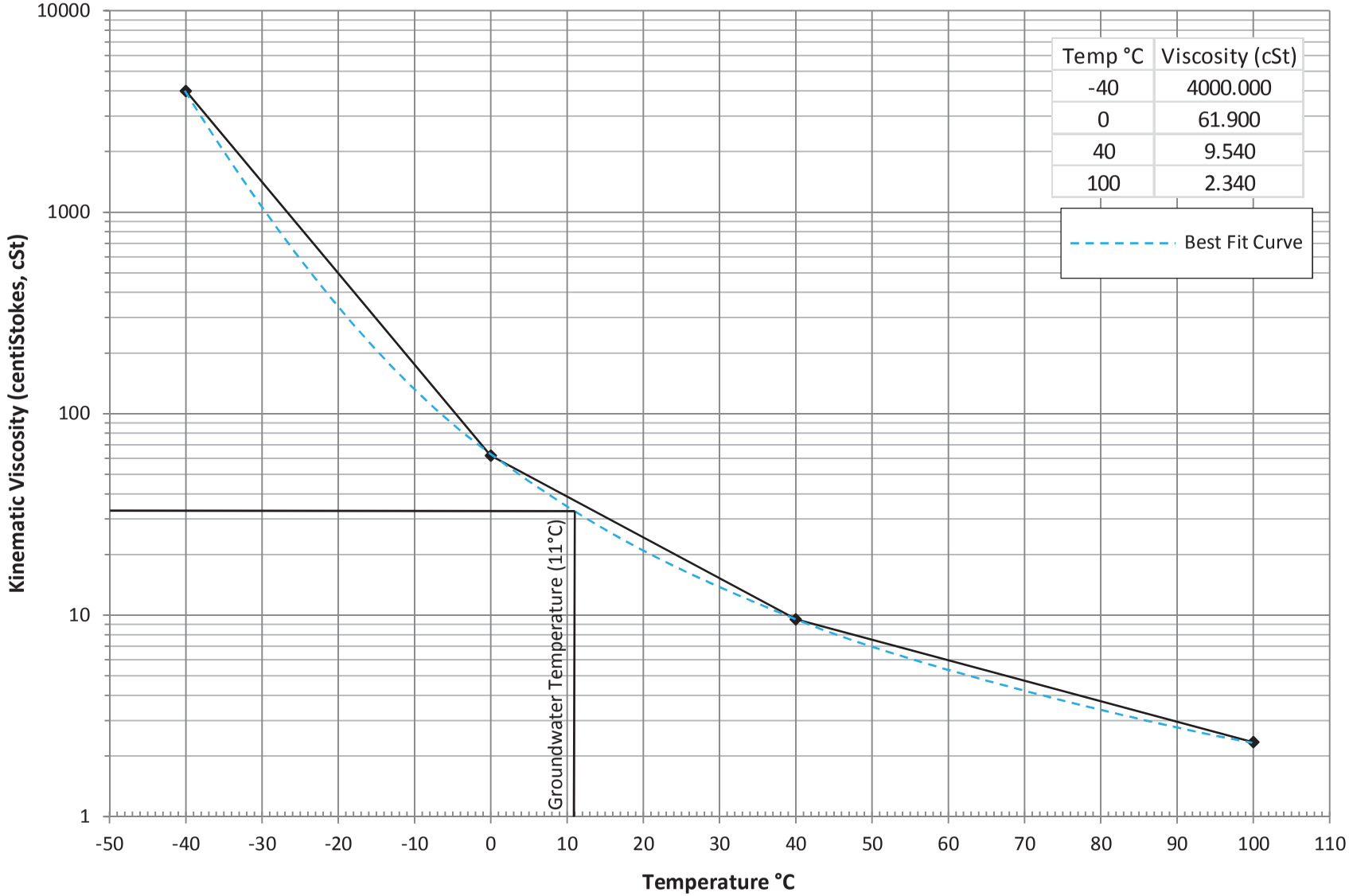
Figure 4
Groundwater Dynamic Viscosity



Temperature (^{o}C)	Dynamic Viscosity ($N\ s/m^2$) x 10^{-3}
0	1.787
5	1.519
10	1.307
20	1.002
30	0.798
40	0.653
50	0.547
60	0.467
70	0.404
80	0.355
90	0.315
100	0.282

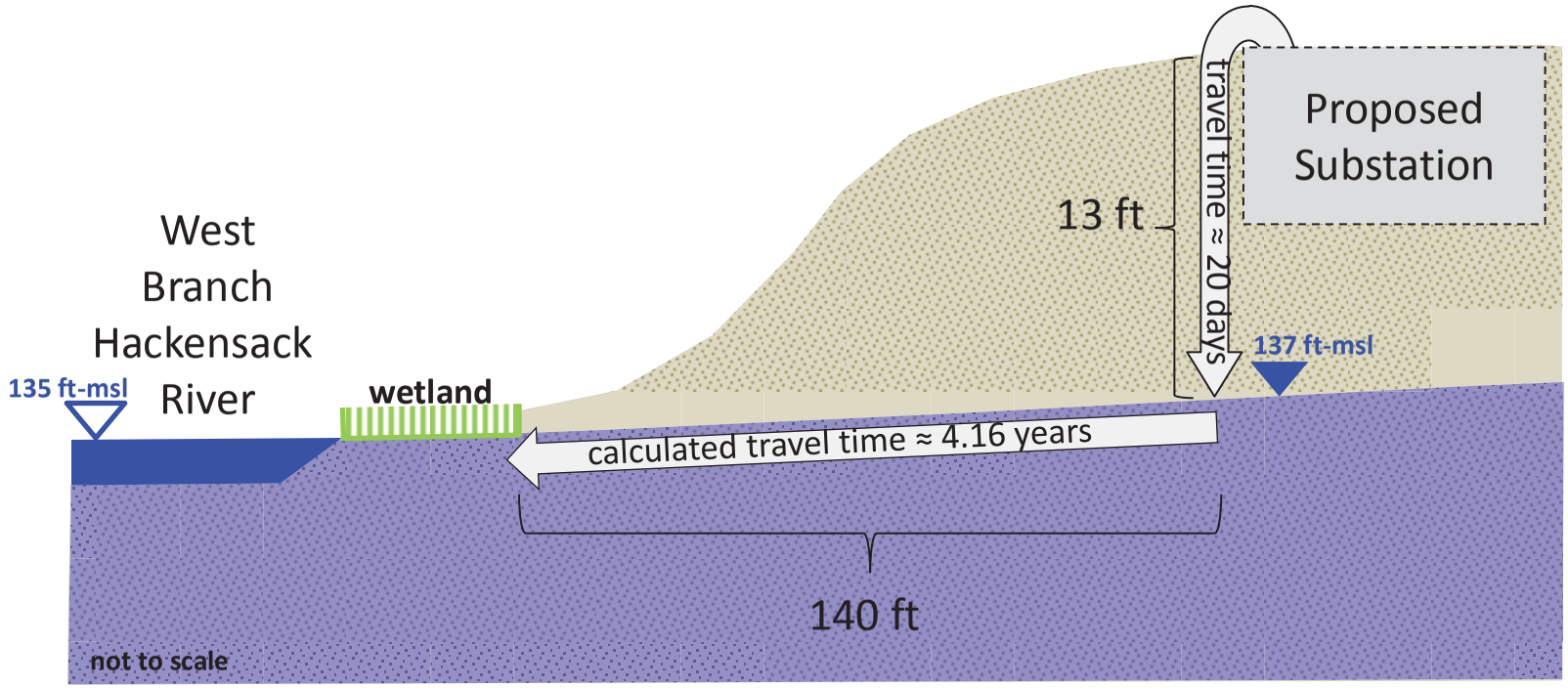
Data from www.engineeringtoolbox.com

Figure 5
Kinematic Viscosity of Electrical Insulating Oil



Temp °C	Viscosity (cSt)
-40	4000.000
0	61.900
40	9.540
100	2.340

Data from Cross Oil Refining & Marketing , Inc. CrossTrans 206 Insulating Oil Typical Properties (revised 6/15/10)



Fine to coarse sand above water table

Conceptual migration path of electrical insulating oil with calculated travel time

Fine to coarse sand below water table

137 ft-msl Estimated Water Table Elevation

135 ft-msl Estimated River Stage Elevation

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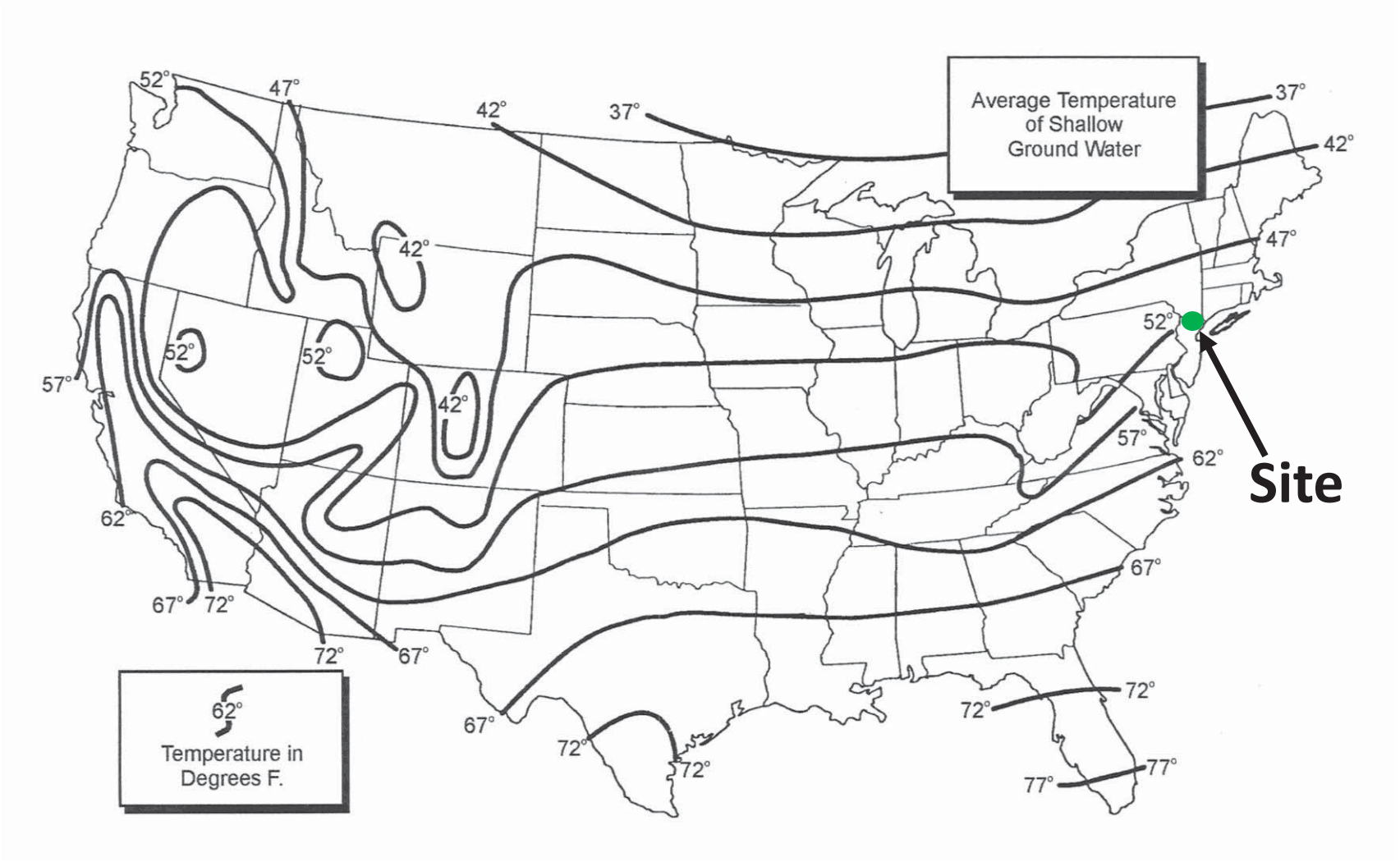
Cross Section of Conceptual Site Model and Calculation Results for Theoretical Electrical Insulating Oil Migration

Clarkstown New York

Job No.	Date	Scale	Figure
190011601	02/14/14	as noted	1



Source: United States Environmental Protection Agency

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Average Temperature of Shallow Groundwater in the United States

Clarkstown New York

Job No.	Date	Scale	Figure
190011601	01/30/14		2

APPENDIX D-
Websites for Manufacturers of Oil Containment Products

MANUFACTURERS OF OIL CONTAINMENT PRODUCTS

SPI – Solidification Products International, Inc.
http://www.oilbarriers.com/index.aspx

C.I.Agent Solutions
http://www.ciagent.com/

Strongwell
http://www.strongwell.com/products/containment-systems/

Seaman Corporation
http://xr-technology.com/case-histories/ch.php?id=16

APPENDIX E-
Material Safety Data Sheets

SAFETY DATA SHEET

1. Identification

Product identifier **Natural Gas (Odorized)**

Other means of identification Not available.

Synonyms Methane, Petroleum Gas, Methyl Hydride, Treated Gas, Process Gas

Recommended use Fuel.

Recommended restrictions None known.

Manufacturer / Importer / Supplier / Distributor information

Company name Williams, Inc.

Address One Williams Center
Tulsa, OK 74172
US

Telephone 800-688-7507

E-mail enterpriseehs@williams.com

Emergency phone number 888-677-2370

2. Hazard(s) identification

Physical hazards Flammable gases — Category 1
Gases under pressure — Compressed gas

Health hazards Not classified.

OSHA hazard(s) Simple asphyxiant

Label elements

Hazard symbol

Signal word Danger

Hazard statement Extremely flammable gas. Contains gas under pressure; may explode if heated. May displace oxygen and cause rapid suffocation.

Precautionary statement

Prevention Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Response Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

Storage Protect from sunlight. Store in a well-ventilated place.

Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC) Not classified.

3. Composition/information on ingredients

Mixture

Hazardous components

Chemical name	Common name and synonyms	CAS number	%
Natural gas		8006-14-2	100

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.
Odorized products contain small quantities (<0.1%) ethyl mercaptan as an olfactory indicator.

4. First-aid measures

Inhalation Move injured person into fresh air and keep person calm under observation. If breathing is difficult, give oxygen. Get medical attention if any discomfort continues.

Skin contact Frostbite: Do not remove clothes, but flush with copious amounts of lukewarm water. Call an ambulance and continue to flush during transportation to hospital.

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation develops or persists.
Ingestion	This material is a gas under normal atmospheric conditions and ingestion is unlikely.
Most important symptoms/effects, acute and delayed	Narcosis. Behavioral changes. Decrease in motor functions.
Indication of immediate medical attention and special treatment needed	Treat symptomatically.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

Suitable extinguishing media	Extinguish with foam, carbon dioxide, dry powder or water fog.
Unsuitable extinguishing media	None.
Specific hazards arising from the chemical	Extremely flammable gas. Closed containers can burst violently when heated, due to excess pressure build-up. Gas may travel considerable distance to a source of ignition and flash back. Gases may form explosive mixtures with air. Fire or high temperatures create: Carbon monoxide. Carbon oxides. Sulfur oxides.
Special protective equipment and precautions for firefighters	Selection of respiratory protection for firefighting: follow the general fire precautions indicated in the workplace. Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with full face-piece operated in positive pressure mode. Use approved gas detectors in confined spaces.
Fire-fighting equipment/instructions	Evacuate area. Move container from fire area if it can be done without risk. Stay away from ends of tanks. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect men attempting to stop a leak. Cool equipment exposed to flames with water, if it can be done without risk. Close the valve if no risk is involved. Do not extinguish a leaking gas fire unless leak can be stopped. If leak cannot be stopped and no danger to surrounding area allow the fire to burn out. Fight fire from a protected location. Prevent buildup of vapors or gases to explosive concentrations.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Extremely flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. Beware of accumulation in low areas or contained areas, where explosive concentrations may occur. Prevent from entering drains or any places where accumulation may occur. Ventilate well and allow to evaporate. Stay upwind. Avoid inhalation and contact with skin and eyes. For large spillages notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate personal protective equipment (See Section 8).
Methods and materials for containment and cleaning up	In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.
Environmental precautions	Stop leak if possible without any risk. Water may be useful in minimizing or dispersing vapors. If spill occurs on water notify appropriate authorities in accordance with all applicable regulations.

7. Handling and storage

Precautions for safe handling	Keep away from sources of ignition - No smoking. Take precautionary measures against static discharges. Observe good industrial hygiene practices. Wear appropriate personal protective equipment (See Section 8). Contents under pressure. Gas can accumulate in confined spaces and limit oxygen available for breathing. Use only with adequate ventilation. Use non-sparking hand tools and explosion-proof electrical equipment. The product can accumulate electrostatic charges, which may cause an electrical spark (ignition source). Ground container and transfer equipment to eliminate static electric sparks. Before entering storage tanks and commencing any operation in a confined area, check the atmosphere for oxygen content, hydrogen sulfide (H2S) and flammability. Cold burns may occur during filling operations. Containers and delivery lines may become cold enough to present cold burn hazard. The use hydrocarbon fuel in an area without adequate ventilation may result in hazardous levels of incomplete combustion products (e.g. carbon monoxide, oxides of sulfur and nitrogen, benzene and other hydrocarbons) and/or dangerously low oxygen levels.

Conditions for safe storage, including any incompatibilities

Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post areas "No Smoking or Open Flame." Store away from incompatible materials. Protect against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

Empty containers may contain flammable product residues. Do not pressurize, cut, weld, braze, solder, drill, grind or expose empty containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death.

8. Exposure controls/personal protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

Components	Type	Value
Natural gas (CAS 8006-14-2)	TWA	1000 ppm

Biological limit values No biological exposure limits noted for the ingredient(s).

Exposure guidelines No exposure standards allocated.

Appropriate engineering controls Provide shower facilities near the work place. In confined spaces, make sure the area is well-ventilated and sufficient oxygen (19.5%) exists before entry. Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Use explosion-proof equipment.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear approved safety glasses as a good hygiene practice.

Skin protection

Hand protection Wear suitable gloves as a good hygiene practice.

Other Wear suitable protective clothing.

Respiratory protection A NIOSH approved, self-containing breathing apparatus (SCBA) or equivalent operated in a pressure demand or other positive pressure mode should be used in situations of oxygen deficiency (oxygen content less than 19.5 percent), unknown exposure concentrations, or situations that are immediately dangerous to life or health (IDLH). A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever work place conditions warrant a respirator's use.

Thermal hazards Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Handle in accordance with good industrial hygiene and safety practice.

9. Physical and chemical properties

Appearance Colorless gas.

Physical state Gas Compressed.

Form Gas.

Color Colorless.

Odor Slight.

Odor threshold Not available.

pH Not applicable.

Melting point/freezing point Not available.

Initial boiling point and boiling range -259.6 °F (-162 °C)

Flash point -304.6 °F (-187 °C)

Evaporation rate Not available.

Flammability (solid, gas) Extremely flammable gas.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) 5 %

Flammability limit - upper (%) 15 %

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure	40 mm Hg (77°F/25°C)
Vapor density	0.55 Approximate.
Relative density	Not available.
Solubility(ies)	Slightly soluble in water.
Partition coefficient (n-octanol/water)	1.81
Auto-ignition temperature	> 550.4 °F (> 288 °C)
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Percent volatile	100

10. Stability and reactivity

Reactivity	The product is non-reactive under normal conditions of use, storage and transport.
Chemical stability	Stable under normal temperature conditions and recommended use.
Possibility of hazardous reactions	Polymerization will not occur.
Conditions to avoid	Heat, sparks, flames, elevated temperatures. Do not pressurize, cut, weld, braze, solder, drill, grind or expose empty containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode and cause injury or death.
Incompatible materials	Oxidizing agents.
Hazardous decomposition products	Carbon oxides. Sulfur oxides.

11. Toxicological information

Information on likely routes of exposure

Ingestion	This material is a gas under normal atmospheric conditions and ingestion is unlikely.
Inhalation	High concentrations: Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. In high concentrations, vapors are narcotic and may cause headache, fatigue, dizziness and nausea.
Skin contact	Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.
Eye contact	Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.
Symptoms related to the physical, chemical and toxicological characteristics	Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn"). Contact with evaporating liquid may cause frostbite or freezing of skin. Symptoms of overexposure can include shortness of breath, drowsiness, headaches, confusion, decreased coordination, visual disturbances and vomiting, and are reversible if exposure is stopped. Continued exposure can lead to hypoxia (inadequate oxygen), rapid breathing, cyanosis (bluish discoloration of skin), numbness of the extremities, unconsciousness and death.

Information on toxicological effects

Acute toxicity	Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn").

Product	Species	Test Results
Natural gas (CAS 8006-14-2)		
Acute		
Oral		
LD50	Rat	> 5 g/kg

Skin corrosion/irritation	Not classified.
Serious eye damage/eye irritation	Not classified.
Respiratory sensitization	Not classified.
Skin sensitization	Not a skin sensitizer.
Germ cell mutagenicity	Not classified.
Carcinogenicity	Not classified.
Reproductive toxicity	Not classified.
Specific target organ toxicity - single exposure	Not classified.
Specific target organ toxicity - repeated exposure	Not classified.

Aspiration hazard	Not applicable.
Chronic effects	Prolonged exposure may cause chronic effects.

12. Ecological information

Ecotoxicity	Not expected to be harmful to aquatic organisms.
Persistence and degradability	The hydrocarbons in this material are expected to be inherently biodegradable. In practice, hydrocarbon gases are not likely to remain in solution long enough for biodegradation to be a significant loss process. Hydrogen sulfide, if present in refinery gas streams, will be oxidized in water and insoluble sulfides precipitated from water when metallic radicals are present.
Bioaccumulative potential	The product is not expected to bioaccumulate.

Partition coefficient n-octanol / water (log Kow)

Natural gas	1.81

Mobility in soil	Not relevant, due to the form of the product.
Mobility in general	The product is a volatile substance, which may spread in the atmosphere.
Other adverse effects	The product is a volatile organic compound which has a photochemical ozone creation potential.

13. Disposal considerations

Disposal instructions	This material is a gas and would not typically be managed as a waste.
Local disposal regulations	Disposal recommendations are based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.
Hazardous waste code	D001
Waste from residues / unused products	Dispose of in accordance with local regulations.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number	UN1971
UN proper shipping name	Natural gas, compressed
Transport hazard class(es)	2.1
Subsidary class(es)	Not available.
Packing group	Not available.
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.
Labels required	2.1
Packaging exceptions	306
Packaging non bulk	302
Packaging bulk	302

IATA

UN number	UN1971
UN proper shipping name	Natural gas, compressed
Transport hazard class(es)	2.1
Subsidary class(es)	-
Packaging group	Not available.
Environmental hazards	No
Labels required	2.1
ERG Code	10L
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number	UN1971
UN proper shipping name	NATURAL GAS, COMPRESSED
Transport hazard class(es)	2.1
Subsidary class(es)	-
Packaging group	Not available.
Environmental hazards	
Marine pollutant	No
Labels required	2,1
EmS	F-D, S-U
Special precautions for user	Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	No information available.

15. Regulatory information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not on regulatory list.

CERCLA Hazardous Substance List (40 CFR 302.4)

Natural gas (CAS 8006-14-2) LISTED

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
Delayed Hazard - No
Fire Hazard - Yes
Pressure Hazard - Yes
Reactivity Hazard - No

SARA 302 Extremely hazardous substance No

SARA 311/312 Hazardous chemical Yes

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

Drug Enforcement Administration (DEA). List 2, Essential Chemicals (21 CFR 1310.02(b) and 1310.04(f)(2) and Chemical Code Number

Not listed.

Drug Enforcement Administration (DEA). List 1 & 2 Exempt Chemical Mixtures (21 CFR 1310.12(c))

Not regulated.

DEA Exempt Chemical Mixtures Code Number

Not regulated.

Food and Drug Administration (FDA) Not regulated.

US state regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List

Natural gas (CAS 8006-14-2)

US. New Jersey Worker and Community Right-to-Know Act

Not regulated.

US. Pennsylvania RTK - Hazardous Substances

Natural gas (CAS 8006-14-2)

US. Rhode Island RTK

Not regulated.

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Not listed.

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No

Country(s) or region	Inventory name	On inventory (yes/no)*
Japan	Inventory of Existing and New Chemical Substances (ENCS)	No
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s)

16. Other information, including date of preparation or last version

Issue date	11-08-2012
Revision date	-
Version #	01
Further information	Not available.
References	Registry of Toxic Effects of Chemical Substances (RTECS)
Disclaimer	This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.

MATERIAL SAFETY DATA SHEET

Form #: MSDS 853020
Revised: 06/06/13
Supersedes: 05/01/11
ECO #: 1001294

I. PRODUCT IDENTIFICATION

Chemical Trade Name (as used on label):
Lead-Acid Battery

Manufacturer's Name/Address:
EnerSys
P.O. Box 14145
2366 Bernville Road
Reading, PA 19612-4145

Chemical Family/Classification:
Electric Storage Battery

Telephone:
For information and emergencies, contact EnerSys' Environmental, Health & Safety Dept. at 610-208-1996

24-Hour Emergency Response Contact:
CHEMTREC DOMESTIC: 800-424-9300
CHEMTREC INTERNATIONAL: 703-527-3877

II. HAZARDOUS INGREDIENTS/IDENTIFY INFORMATION

Components	CAS Number	Approximate % by Wt. Or Vol.	Air Exposure Limits (ug/m³) OSHA	ACGIH	NIOSH
Inorganic Lead Compound:					
Lead	7439-92-1	60	50	150	100
* Antimony	7440-36-0	2	500	500	--
* Arsenic	7440-38-2	0.2	10	200	--
* Calcium	7440-70-2	0.2	--	--	--
* Tin	7440-31-5	0.2	2000	2000	--
Electrolyte (Sulfuric Acid)	7664-93-9	10-30	1000	1000	1000
Case Material:		5-10	N/A	N/A	N/A
Polypropylene	9003-07-0				
Polystyrene	9003-53-6				
Styrene Acrylonitrile	9003-54-7				
Acrylonitrile Butadiene Styrene	9003-56-9				
Styrene Butadiene	9003-55-8				
Polyvinylchloride	9002-86-2				
Polycarbonate, Hard Rubber, Polyethylene	--				
Other:					
Silicon Dioxide (Gel batteries only)	7631-86-9	20-40	N/A	N/A	N/A
Sheet Molding Compound (Glass reinforced polyester)	--		N/A	N/A	N/A

Inorganic lead and electrolyte (sulfuric acid) are the primary components of every battery manufactured by EnerSys.
Other ingredients may be present dependent upon battery type. Contact your EnerSys representative for additional information.

III. PHYSICAL DATA

Electrolyte:

Boiling Point:	203 - 240° F	**Specific Gravity (H2O = 1):**	1.215 to 1.350
Melting Point:	N/A	**Vapor Pressure (mm Hg):**	10
Solubility in Water:	100%	**Vapor Density (AIR = 1):**	Greater than 1
Evaporation Rate: (Butyl Acetate = 1)	Less than 1	**% Volatile by Weight:**	N/A
Appearance and Odor:	Manufactured article; no apparent odor. Electrolyte is a clear liquid with a sharp, penetrating, pungent odor.		

IV. FIRE AND EXPLOSION HAZARD DATA

Flash Point: N/A **Flammable Limits:** LEL = 4.1% (Hydrogen Gas) UEL = 74.2%

Extinguishing Media: CO2; foam; dry chemical

Special Fire Fighting Procedures:
If batteries are on charge, shut off power. Use positive pressure, self-contained breathing apparatus. Water applied to electrolyte generates heat and causes it to spatter. Wear acid-resistant clothing.

Unusual Fire and Explosion Hazards:
Highly flammable hydrogen gas is generated during charging and operation of batteries. To avoid risk of fire or explosion, keep sparks or other sources of ignition away from batteries. Do not allow metallic materials to simultaneously contact negative and positive terminals of cells and batteries. Follow manufacturer's instructions for installation and service.

V. REACTIVITY DATA

Stability: Stable

Conditions To Avoid: Prolonged overcharge; sources of ignition

Incompatibility: (Materials to avoid)
Sulfuric Acid: Contact with combustibles and organic materials may cause fire and explosion. Also reacts violently with strong reducing agents, metals, sulfur trioxide gas, strong oxidizers and water. Contact with metals may produce toxic sulfur dioxide fumes and may release flammable hydrogen gas.
Lead Compounds: Avoid contact with strong acids, bases, halides, halogenates, potassium nitrate, permanganate, peroxides, nascent hydrogen and reducing agents.

Hazardous Decomposition Products:
Sulfuric Acid: Sulfur trioxide, carbon monoxide, sulfuric acid mist, sulfur dioxide, and hydrogen.
Lead Compounds: High temperatures likely to produce toxic metal fumes, vapor, or dust; contact with strong acid or base or presence of nascent hydrogen may generate highly toxic arsine gas.

VI. HEALTH HAZARD DATA

Routes of Entry:

Sulfuric Acid: Harmful by all routes of entry.
Lead Compounds: Hazardous exposure can occur only when product is heated, oxidized or otherwise processed or damaged to create dust, vapor or fume.

Inhalation:

Sulfuric Acid: Breathing of sulfuric acid vapors or mists may cause severe respiratory irritation.
Lead Compounds: Inhalation of lead dust or fumes may cause irritation of upper respiratory tract and lungs.

Ingestion:

Sulfuric Acid: May cause severe irritation of mouth, throat, esophagus and stomach.
Lead Compounds: Acute ingestion may cause abdominal pain, nausea, vomiting, diarrhea and severe cramping. This may lead rapidly to systemic toxicity and must be treated by a physician.

Skin Contact:

Sulfuric Acid: Severe irritation, burns and ulceration.
Lead Compounds: Not absorbed through the skin.

Eye Contact:

Sulfuric Acid: Severe irritation, burns, cornea damage, and blindness.
Lead Components: May cause eye irritation.

Effects of Overexposure - Acute:

Sulfuric Acid: Severe skin irritation, damage to cornea, upper respiratory irritation.
Lead Compounds: Symptoms of toxicity include headache, fatigue, abdominal pain, loss of appetite, muscular aches and weakness, sleep disturbances and irritability.

Effects of Overexposure - Chronic:

Sulfuric Acid: Possible erosion of tooth enamel, inflammation of nose, throat and bronchial tubes.
Lead Compounds: Anemia; neuropathy, particularly of the motor nerves, with wrist drop; kidney damage; reproductive changes in males and females.

Carcinogenicity:

Sulfuric Acid: The International Agency for Research on Cancer (IARC) has classified "strong inorganic acid mist containing sulfuric acid" as a Category I carcinogen, a substance that is carcinogenic to humans. This classification does not apply to liquid forms of sulfuric acid or sulfuric acid solutions contained within a battery. Inorganic acid mist (sulfuric acid mist) is not generated under normal use of this product. Misuse of the product, such as overcharging, may result in the generation of sulfuric acid mist.
Lead Compounds: Lead is listed as a 2B carcinogen, likely in animals at extreme doses. Proof of carcinogenicity in humans is lacking at present.
Arsenic: Listed by National Toxicology Program (NTP), International Agency for Research on Cancer (IARC), OSHA and NIOSH as a carcinogen only after prolonged exposure at high levels.

Medical Conditions Generally Aggravated by Exposure:

Overexposure to sulfuric acid mist may cause lung damage and aggravate pulmonary conditions. Contact of sulfuric acid with skin may aggravate diseases such as eczema and contact dermatitis. Lead and its compounds can aggravate some forms of kidney, liver and neurologic diseases.

EMERGENCY AND FIRST AID PROCEDURES:

Inhalation:

Sulfuric Acid: Remove to fresh air immediately. If breathing is difficult, give oxygen.
Lead: Remove from exposure, gargle, wash nose and lips; consult physician.

Ingestion:

Sulfuric Acid: Give large quantities of water; do not induce vomiting; consult physician.
Lead: Consult physician immediately.

Skin:

Sulfuric Acid: Flush with large amounts of water for at least 15 minutes; remove contaminated clothing completely, including shoes.
Lead: Wash immediately with soap and water.

Eyes:

Sulfuric Acid and Lead: Flush immediately with large amounts of water for a least 15 minutes; consult physician.

Proposition 65:

Warning: Battery posts, terminals and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. Batteries also contain other chemicals known to the State of California to cause cancer. Wash hands after handling.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE

Spill or Leak Procedures:

Stop flow of material, contain/absorb small spills with dry sand, earth or vermiculite. Do not use combustible materials. If possible, carefully neutralize spilled electrolyte with soda ash, sodium bicarbonate, lime, etc. Wear acid-resistant clothing, boots, gloves, and face shield. Do not allow discharge of unneutralized acid to sewer.

Waste Disposal Methods:

Spent batteries: Send to secondary lead smelter for recycling.
Place neutralized slurry into sealed containers and handle as applicable with state and federal regulations. Large water-diluted spills, after neutralization and testing, should be managed in accordance with approved local, state and federal requirements. Consult state environmental agency and/or federal EPA.

VII. PRECAUTIONS FOR SAFE HANDLING AND USE (Cont.)

Handling and Storage:

Store batteries in cool, dry, well-ventilated areas with impervious surfaces and adequate containment in the event of spills. Batteries should also be stored under roof for protection against adverse weather conditions. Separate from incompatible materials. Store and handle only in areas with adequate water supply and spill control. Avoid damage to containers. Keep away from fire, sparks and heat.

Precautionary Labeling:

POISON - CAUSES SEVERE BURNS DANGER - CONTAINS SULFURIC ACID

VIII. CONTROL MEASURES

Engineering Controls:

Store and handle in well-ventilated area. If mechanical ventilation is used, components must be acid-resistant.

Work Practices:

Handle batteries cautiously to avoid spills. Make certain vent caps are on securely. Avoid contact with internal components. Wear protective clothing when filling or handling batteries.

Respiratory Protection:

None required under normal conditions. When concentrations of sulfuric acid mist are known to exceed the PEL, use NIOSH or MSHA-approved respiratory protection.

Protective Gloves:

Rubber or plastic acid-resistant gloves with elbow-length gauntlet.

Eye Protection:

Chemical goggles or face shield.

Other Protection:

Acid-resistant apron. Under severe exposure emergency conditions, wear acid-resistant clothing and boots.

Emergency Flushing:

In areas where sulfuric acid is handled in concentrations greater then 1%, emergency eyewash stations and showers should be provided, with unlimited water supply.

IX. OTHER REGULATORY INFORMATION

NFPA Hazard Rating for Sulfuric Acid:

Flammability (Red) = 0
Health (Blue) = 3
Reactivity (Yellow) = 2
Sulfuric acid is water-reactive if concentrated.

U.S. DOT:

The shipping information is as follows:

Proper Shipping Name: Batteries, wet, filled with acid
Hazardous Class: 8
UN Identification: UN2794
Packing Group: III
Label/Placard Required: Corrosive

Reference 49 CFR Packing Instructions 173.159

IATA:

The shipping information is as follows:

Proper Shipping Name: Batteries, wet, filled with acid
Hazardous Class: 8
UN Identification: UN2794
Packing Group: II
Label/Placard Required: Corrosive

Reference IATA packing instructions 870

IMDG:

The shipping information is as follows:

Proper Shipping Name: Batteries, wet, filled with acid
Hazardous Class: 8
UN Identification: UN2794
Packing Group: N/A
Label/Placard Required: Corrosive

Reference IMDG packing instructions P801

IX. OTHER REGULATORY INFORMATION (Cont.)

RCRA:

Spent lead-acid batteries are not regulated as hazardous waste by the EPA when recycled, however state and international regulations may vary.

CERCLA (Superfund) and EPCRA:

(a) Reportable Quantity (RQ) for spilled 100% sulfuric acid under CERCLA (Superfund) and EPCRA (Emergency Planning Community Right to Know Act) is 1,000 lbs. State and local reportable quantities for spilled sulfuric acid may vary.

(b) Sulfuric acid is a listed "Extremely Hazardous Substance" under EPCRA, with a Threshold Planning Quantity (TPQ) of 1,000 lbs.

(c) EPCRA Section 302 notification is required if 1,000 lbs. or more of sulfuric acid is present at one site. The quantity of sulfuric acid will vary by battery type. Contact your EnerSys representative for additional information.

(d) EPCRA Section 312 Tier 2 reporting is required for batteries if sulfuric acid is present in quantities of 500 lbs. or more and/or if lead is present in quantities of 10,000 lbs. or more.

(e) Supplier Notification: This product contains toxic chemicals, which may be reportable under EPCRA Section 313 Toxic Chemical Release Inventory (Form R) requirements.

If you are a manufacturing facility under SIC codes 20 through 39, the following information is provided to enable you to complete the required reports:

Toxic Chemical	CAS Number	Approximate % by Wt.
Lead	7439-92-1	60
Sulfuric Acid	7664-93-9	10 - 30
* Antimony	7440-36-0	2
* Arsenic	7440-38-2	0.2

If you distribute this product to other manufacturers in SIC Codes 20 through 39, this information must be provided with the first shipment of each calendar year.

The Section 313 supplier notification requirement does not apply to batteries, which are "consumer products".

* Not present in all battery types. Contact your EnerSys representative for additional information.

TSCA:

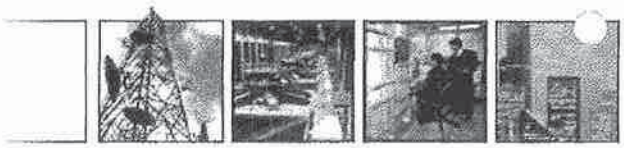
Ingredients in EnerSys' batteries are listed in the TSCA Registry as follows:

	Components	CAS Number	TSCA Status
Electrolyte:	Sulfuric Acid (H_2SO_4)	7664-93-9	Listed
Inorganic Lead Compound:			
	Lead (Pb)	7439-92-1	Listed
	Lead Oxide (PbO)	1317-36-8	Listed
	Lead Sulfate ($PbSO_4$)	7446-14-2	Listed
	Antimony Sb)	7440-36-0	Listed
	Arsenic (As)	7440-38-2	Listed
	Calcium (Ca)	7440-70-2	Listed
	Tin (Sn)	7440-31-5	Listed

CAA:

EnerSys supports preventative actions concerning ozone depletion in the atmosphere due to emissions of CFC's and other ozone depleting chemicals (ODC's), defined by the USEPA as Class I substances. Pursuant to Section 611of the Clean Air Act Amendments (CAAA) of 1990, finalized on January 19, 1993, EnerSys established a policy to eliminate the use of Class I ODC's prior to the May 15, 1993 deadline.

ITEM #	QTY	DESCRIPTION
CE2405	1	CMCBL|C273A - 27FT|COMMUNICATION CABLE|SEL|CABLE DATA AND IRIG|27 FT USE TO CONNECT SEL-2020 OR 2030 (DATA & IRIG) TO SEL 300 SERIES (EXCEPT SEL-321) AND SEL 500 SERIES RELAYS.
CE2406	2	CMCBL|C273A - 30FT|COMMUNICATION CABLE|SEL|CABLE DATA AND IRIG|30 FT USE TO CONNECT SEL-2020 OR 2030 (DATA & IRIG) TO SEL 300 SERIES (EXCEPT SEL-321) AND SEL 500 SERIES RELAYS.
CE2407	2	CMCBL|C273A - 33FT|COMMUNICATION CABLE|SEL|CABLE DATA AND IRIG|33 FT USE TO CONNECT SEL-2020 OR 2030 (DATA & IRIG) TO SEL 300 SERIES (EXCEPT SEL-321) AND SEL 500 SERIES RELAYS.
CE2411	1	CMCBL|SEL-WA2030XX0A|COMMUNICATION CABLE|SEL|SEL-3032 WIRING HARNESS|25 FT
CE2425	3	CS|24202B [DESCRIBED]|CONTROL SWITCH|ELECTROSWITCH|SERIES 24|DOUBLE THROW (NO OFF)|MAINTAINED|OVAL SHANK HANDLE|10D-2X11|2 DECKS|2 POSITIONS ESCUTCHEON, BLANK TITLE, ENGRAVING TO HAVE "REMOTE" IN UPPER POSITION (12:00) AND "LOCAL" IN RIGHT POSITION (2:00) ***COMMENTS - 1-MAIN A; 1-MAIN B; 1-AUX A; 1- AUX B; 1-TIE***
CE2453	11	FU|NON-10|FUSE|BUSSMANN|TYPE NON, CLASS K5|250 VAC|10A|10KA KAIC SYM|GENERAL PURPOSE ONE-TIME
CE2546	6	PT|PTW5-1-110-SD01113F|POTENTIAL TRANSFORMER|ITI|TYPE PTW5|INDOOR|15KV CLASS|110KV BIL|7620:120V (63.5:1)|1500VA AT 30 DEG C|60HZ|1 BUSHING (WYE ONLY)|SINGLE PRIMARY FUSE INCLUDED|1E, 15.5KV|INDICATING FUSE ***COMMENTS - 3-AUX A, 3-AUX B***
CE2601	1	THMST|2E206|THERMOSTAT|DAYTON|E206|1/10 HP, SPDT SWITCH|30 TO 110 DEGREES F|SPDT|120 VAC, 60 HZ
CE2620	8	VCBCK|0346A9300G008|VCB COMPARTMENT KIT|GE|FOR ROLL-IN POWER/VAC BREAKER|5 AND 15KV|1200A|350 AND 1000MVA OR LESS|PORCELAIN INSULATING TUBES|INSULATED SHUTTERS|STYLE B GROUND SHOE ***COMMENTS - 8-FEEDERS***
CE2710	8	MVSW|244-042-510|MEDIUM VOLTAGE SWITCH|ABB|VERSA RUPTER|17KV|110KV|1200A|1200A|40KA RMS|40KA ASYM|3-POLE, FRAME MOUNTED|SNAP ACTION ***COMMENTS - 8-FEEDERS***
CE2827	1	HVAC|WA602-B15XX4XXJ|HVAC|BARD|MODEL WA602|5 TON|208/230VAC|3-PHASE|60HZ|15 KW HEATING|BAROMETRIC AIR DAMPER|STANDARD 1" FILTER|BUCKEYE GRAY|FRONT, STANDARD OUTLET|STANDARD COIL|CONTROL OPTION J
CE2836	1	BAT|3-CA-5 (DESCRIPTION)|BATTERY|EXCIDE|TYPE 3-CA-5|130V 2.17V PER CELL|100 AH|LEAD-ANTIMONY tYPE CA, ANTIMONY FLAT PLATE, 20 UNITS, 60 CELLS TOTAL, 2.17V PER CELL FLOAT VOLTAGE, 100 AMP-HOUR CAPACITY AT THE 8 HOUR RATE. SUPPLY WITH LEAD PLATED COPPER INTER-CELL, ALSO SUPPLY COMPLETELY INSULATED FLEXIBLE CABLE INTER-STEP CONNECTORS.
CE2837	1	BAT|3-CA-5 ACCESSORIES|BATTERY|EXIDE|| EXIDE BATTERY ACCESSORY KIT TO INCLUDE: (1)-CELL LIFTER, (1)-PORTABLE ELECTROLYTE HYDROMETER SYRINGE, (1)-VENT PLUG MOUNTED ELECTROLYTE HYDROMETER SYRINGE, (1)- VENT PLUG MOUNTED THERMOMETER, (1)- CELL NUMBER SET: 1-60.
CE2861	2	MCB|BAB2025|MOLDED CASE BREAKER|CUTLER-HAMMER|TYPE BAB|120/240 VOLT|2-POLE|25A|10KAIC|THERMAL-MAGNETIC|BOLT-ON
CE2862	4	CBLTR|AH3-4-18-L09-144|CABLE TRAY|THOMAS AND BETTS|H STYLE|ALUMINUM|SERIES 3|4" DEPTH|18" WIDTH|LADDER BOTTOM|9" RUNG SPACING|STRAIGHT SECTION|12 FT LENGTH
CE2863	2	CBLTR|AHF-4-18-L-HT-12|CABLE TRAY|THOMAS AND BETTS|H STYLE|ALUMINUM|4" DEPTH|18" WIDTH|LADDER BOTTOM|9" RUNG SPACING|HORIZONTAL TEE|12" RADIUS



Click on one of the following links for Material Safety Data Sheets (MSDS):
If you cannot read these files, click HERE to download Acrobat® Reader FREE!

PowerSafe Flooded Batteries

Type	Description	MSDS Pub. Number
CC	Calcium Flat Plate Flooded	853020
DSG	Calcium Flat Plate Flooded	853020
EC	Calcium Flat Plate Flooded	853020
FTC-P	Calcium Flat Plate Flooded	853020
GU	Calcium Flat Plate Flooded	853020
GC	Calcium Flat Plate Flooded	853020
GN	Calcium Flat Plate Flooded	853020
CA	Antimony Flat Plate Flooded	853020
EA	Antimony Flat Plate Flooded	853020
FTA-P	Antimony Flat Plate Flooded	853020
GT	Antimony Flat Plate Flooded	853020
VVbm	Vented Lead Acid	853020
OPzS	Vented Tubular	853020
Plante	Pure Lead Plante Flooded	853020

DataSafe Flooded Batteries

Type	Description	MSDS Pub. Number
CX	Calcium Flat Plate Flooded	853020
VB	Calcium Flat Plate Flooded	853020
DXC	Calcium Flat Plate Flooded	853020
DX	Calcium Flat Plate Flooded	853020
ES	Calcium Flat Plate Flooded	853020

Type	Description	MSDS Pub. Number
Cyclon	VRLA Battery	853027

Type	Description	MSDS Pub. Number
Odyssey	Drycell Battery	853027

PowerSafe VRLA Batteries

Type	Description	MSDS Pub. Number

SBS	VRLA	853024
V	VRLA	853024
V Front Terminal	VRLA	853024
VX	VRLA	853024
VE	VRLA	853024
DDm	VRLA	853024
DDmP	VRLA	853024
OPzV	VRLA	853020
DDV	VRLA	853024
DGX	VRLA	853020
DDS	VRLA	853024

DataSafe VRLA Batteries

Type	Description	MSDS Pub. Number
HX	VRLA	853024
NPX	VRLA	853024
JX	VRLA	853024
HX-FT	VRLA	853024

Genesis VRLA Batteries

Type	Description	MSDS Pub. Numbe
Genesis EP	Pure Lead VRLA (Warrensburg)	853027
Genesis XE	Pure Lead VRLA (Warrensburg)	853027
NP	Sealed Rechargeable Lead-Acid	853024
NP Gel	Valve Regulated Gel	853020
NPH	Sealed Rechargeable Lead-Acid	853024
NP / U1	Sealed Rechargeable Lead-Acid	853024
RE	Sealed Rechargeable Lead-Acid	853024
REL-B	Sealed Rechargeable Lead-Acid	853024

PowerSafe NICD Batteries

Type	Description	MSDS Pub. Number
RH	Pocket Plate NICD	853025
RM	Pocket Plate NICD	853025
RL	Pocket Plate NICD	853025
VGM	Sealed Pocket Plate NICD	853025
VGL	Sealed Pocket Plate NICD	853025

Miscellaneous

Description	MSDS Pub. Number
Battery Electrolyte	853022
Dry Charge Battery	853021

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EnerSys
Legal Information

Praxair Material Safety Data Sheet

1. Chemical Product and Company Identification

Product Name: Nitrogen, compressed	**Trade Names:** Nitrogen, Medipure® Nitrogen, Extendapak® Nitrogen
Chemical Name: Nitrogen	**Synonyms:** Dinitrogen, Refrigerant R728
Chemical Family: Permanent gas	**Product Grades:** 4.8; 5.0, 5.5, 6.0 SPG; 4.8 VEZ; 5.0 UHP; Bev; Extendapak®; NF 4.8, 5.0 MD; 4.8 OF; 4.8 Z; 5.0 VOCF; 5.0 UZAM; 5.5 ECD; 6.0 Research; Industrial, 5.0, 5.5 LaserStar; 5.5 TA; 4.8 OF; 5.5 CE; 5.5 EC; 5.5 TG

Telephone: **Emergencies:** 1-800-645-4633* **Company Name:** Praxair, Inc.
CHEMTREC: 1-800-424-9300* 39 Old Ridgebury Road
Routine: 1-800-PRAXAIR Danbury, CT 06810-5113

**Call emergency numbers 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product. For routine information, contact your supplier, Praxair sales representative, or call 1-800-PRAXAIR (1-800-772-9247).*

2. Hazards Identification

EMERGENCY OVERVIEW

WARNING! High-pressure gas.
Can cause rapid suffocation.
May cause dizziness and drowsiness.
Self-contained breathing apparatus may be required by rescue workers.
Under ambient conditions, this a colorless, odorless, inert gas.

OSHA REGULATORY STATUS: This material is considered hazardous by the OSHA Hazard Communications Standard (29 CFR 1910.1200).

POTENTIAL HEALTH EFFECTS:

Effects of a Single (Acute) Overexposure

Inhalation. Asphyxiant. Effects are due to lack of oxygen. Moderate concentrations may cause headache, drowsiness, dizziness, excitation, excess salivation, vomiting, and unconsciousness. Lack of oxygen can kill.

Skin Contact. No harm expected.

Swallowing. An unlikely route of exposure. This product is a gas at normal temperature and pressure.

Eye Contact. No harm expected.

Effects of Repeated (Chronic) Overexposure. No harm expected.

Other Effects of Overexposure. Asphyxiant. Lack of oxygen can kill.

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A vertical line in the left margin indicates revised or new material.

Medical Conditions Aggravated by Overexposure. The toxicology and the physical and chemical properties of nitrogen suggest that overexposure is unlikely to aggravate existing medical conditions.

CARCINOGENICITY: Nitrogen is not listed by NTP, OSHA, or IARC.

POTENTIAL ENVIRONMENTAL EFFECTS: None known. For further information, see section 12, Ecological Information.

3. Composition/Information on Ingredients

See section 16 for important information about mixtures.

COMPONENT	CAS NUMBER	CONCENTRATION
Nitrogen	7727-37-9	>99%*

**The symbol > means "greater than."*

4. First Aid Measures

INHALATION: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, qualified personnel may give oxygen. Call a physician.

SKIN CONTACT: An unlikely route of exposure. This product is a gas at normal temperature and pressure.

SWALLOWING: An unlikely route of exposure. This product is a gas at normal temperature and pressure.

EYE CONTACT: An unlikely route of exposure. This product is a gas at normal temperature and pressure.

NOTES TO PHYSICIAN: *There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.*

5. Fire Fighting Measures

FLAMMABLE PROPERTIES: Nitrogen cannot catch fire.

SUITABLE EXTINGUISHING MEDIA: Nitrogen cannot catch fire. Use media appropriate for surrounding fire.

PRODUCTS OF COMBUSTION: Not applicable.

PROTECTION OF FIREFIGHTERS: WARNING! High-pressure gas. Asphyxiant. Lack of oxygen can kill. Evacuate all personnel from danger area. Immediately deluge cylinders with water from maximum distance until cool; then move them away from fire area if without risk. Shut off flow if you can do so without risk. Self-contained breathing apparatus may be required by rescue workers. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR1910 Subpart L—Fire Protection.

Specific Physical and Chemical Hazards. Heat of fire can build pressure in cylinder and cause it to rupture. No part of cylinder should be subjected to a temperature higher than 125°F (52°C). Nitrogen cylinders are equipped with a pressure relief device. (Exceptions may exist where authorized by DOT.)

Protective Equipment and Precautions for Firefighters. Firefighters should wear self-contained breathing apparatus and full fire-fighting turnout gear.

6. Accidental Release Measures

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

WARNING! High-pressure gas.

Personal Precautions. Asphyxiant. Lack of oxygen can kill. Evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Shut off flow if you can do so without risk. Ventilate area or move cylinder to a well-ventilated area. Test for sufficient oxygen, especially in confined spaces, before allowing reentry.

Environmental Precautions. Prevent waste from contaminating the surrounding environment. Discard any product, residue, disposable container, or liner in an environmentally acceptable manner, in full compliance with federal, state, and local regulations. If necessary, call your local supplier for assistance.

7. Handling and Storage

PRECAUTIONS TO BE TAKEN IN HANDLING: ***Protect cylinders from damage.*** Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. Close valve after each use; keep closed even when empty. If valve is hard to open, discontinue use and contact your supplier. For other precautions in using nitrogen, see section 16.

PRECAUTIONS TO BE TAKEN IN STORAGE: ***Store and use with adequate ventilation. Always secure cylinders upright to keep them from falling or being knocked over.*** Install valve protection cap, if provided, firmly in place by hand. Store only where temperature will not exceed 125°F (52°C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.

RECOMMENDED PUBLICATIONS: For further information on storage, handling, and use, see Praxair publication P-14-153, *Guidelines for Handling Gas Cylinders and Containers*. Obtain from your local supplier.

8. Exposure Controls/Personal Protection

COMPONENT	OSHA PEL	ACGIH TLV-TWA (2013)
Nitrogen	N.E.*	Simple asphyxiant

*N.E.–Not Established.

IDLH = Not available.

ENGINEERING CONTROLS:

Local Exhaust. Use a local exhaust system, if necessary, to prevent oxygen deficiency.

Mechanical (General). General exhaust ventilation may be acceptable if it can maintain an adequate supply of air.

Special. None

Other. None

PERSONAL PROTECTIVE EQUIPMENT:

Skin Protection. Wear work gloves when handling cylinders and metatarsal shoes for cylinder handling. Select in accordance with OSHA 29 CFR 1910.132, 1910.136, and 1910.138.

Eye/Face Protection. Wear safety glasses when handling cylinders. Select in accordance with OSHA 29 CFR 1910.133.

Respiratory Protection. None required under normal use. Air-supplied respirators must be used in confined spaces or in an oxygen-deficient atmosphere. Respiratory protection must conform to OSHA rules as specified in 29 CFR 1910.134. Select in accordance with 29 CFR 1910.134 and ANSI Z88.2.

9. Physical and Chemical Properties

APPEARANCE:	Colorless gas
ODOR:	Odorless
ODOR THRESHOLD:	Not available.
PHYSICAL STATE:	Gas at normal temperature and pressure
pH:	Not applicable.
MELTING POINT at 1 atm:	-346°F (-210°C)
BOILING POINT at 1 atm:	-320.44°F (-195.80°C)
FLASH POINT (test method):	Not applicable.
EVAPORATION RATE (Butyl Acetate = 1):	Not applicable.
FLAMMABILITY:	Nonflammable
FLAMMABLE LIMITS IN AIR, % by volume:	**LOWER:** Not applicable. **UPPER:** Not applicable.
LIQUID DENSITY at boiling point and 1 atm:	50.7 lb/ft^3 (808.5 kg/m^3)
VAPOR PRESSURE at 68°F (20°C):	Not applicable.
VAPOR DENSITY at 70°F (21.1°C) and 1 atm:	0.0724 lb/ft^3 (1.160 kg/m^3)
SPECIFIC GRAVITY (H_2O = 1) at 19.4°F (-7°C):	Not available.
SPECIFIC GRAVITY (Air = 1) at 70°F (21.1°C) and 1 atm:	0.967
SOLUBILITY IN WATER, vol/vol at 32°F (0°C)	0.023
PARTITION COEFFICIENT: n-octanol/water:	Not available.
AUTOIGNITION TEMPERATURE:	Not applicable.
DECOMPOSITION TEMPERATURE:	Not available.
PERCENT VOLATILES BY VOLUME:	100
MOLECULAR WEIGHT:	28.01
MOLECULAR FORMULA:	N_2

10. Stability and Reactivity

CHEMICAL STABILITY: ☐ Unstable ☒ Stable

CONDITIONS TO AVOID: High temperatures, exposure to lithium, neodymium, titanium and magnesium

INCOMPATIBLE MATERIALS: None known.

HAZARDOUS DECOMPOSITION PRODUCTS: None known.

POSSIBILITY OF HAZARDOUS REACTIONS: ☒ May Occur ☐ Will Not Occur

Under certain conditions, nitrogen can react violently with lithium, neodymium, titanium [above 1472°F (800°C)], and magnesium to form nitrides. At high temperature it can also combine with oxygen and hydrogen.

11. Toxicological Information

ACUTE DOSE EFFECTS: Nitrogen is a simple asphyxiant.

STUDY RESULTS: None known.

12. Ecological Information

ECOTOXICITY: No adverse ecological effects expected.

OTHER ADVERSE EFFECTS: Nitrogen does not contain any Class I or Class II ozone-depleting chemicals.

13. Disposal Considerations

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier.

14. Transport Information

DOT/IMO SHIPPING NAME: Nitrogen, compressed

HAZARD CLASS: 2.2	**PACKING GROUP/Zone:** NA*	**IDENTIFICATION NUMBER:** UN1066	**PRODUCT RQ:** None

SHIPPING LABEL(s): NONFLAMMABLE GAS

PLACARD (when required): NONFLAMMABLE GAS

* Not applicable.

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position, in a well-ventilated vehicle. Cylinders transported in an enclosed, nonventilated compartment of a vehicle can present serious safety hazards.

Shipment of compressed gas cylinders that have been filled without the owner's consent is a violation of federal law [49 CFR 173.301(e)].

MARINE POLLUTANTS: Nitrogen is not listed as a marine pollutant by DOT.

15. Regulatory Information

The following selected regulatory requirements may apply to this product. Not all such requirements are identified. Users of this product are solely responsible for compliance with all applicable federal, state, and local regulations.

U.S. FEDERAL REGULATIONS:

EPA (ENVIRONMENTAL PROTECTION AGENCY)

CERCLA: COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT OF 1980 (40 CFR Parts 117 and 302):

Reportable Quantity (RQ): None

SARA: SUPERFUND AMENDMENT AND REAUTHORIZATION ACT:

SECTIONS 302/304: Require emergency planning based on Threshold Planning Quantity (TPQ) and release reporting based on Reportable Quantities (RQ) of Extremely Hazardous Substances (EHS) (40 CFR Part 355):

TPQ: None
EHS RQ (40 CFR 355): None

SECTIONS 311/312: Require submission of MSDSs and reporting of chemical inventories with identification of EPA hazard categories. The hazard categories for this product are as follows:

IMMEDIATE: No	**PRESSURE:** Yes
DELAYED: No	**REACTIVITY:** No
	FIRE: No

SECTION 313: Requires submission of annual reports of release of toxic chemicals that appear in 40 CFR Part 372.

Nitrogen is not subject to reporting under Section 313.

40 CFR 68: RISK MANAGEMENT PROGRAM FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION: Requires development and implementation of risk management programs at facilities that manufacture, use, store, or otherwise handle regulated substances in quantities that exceed specified thresholds.

Nitrogen is not listed as a regulated substance.

TSCA: TOXIC SUBSTANCES CONTROL ACT: Nitrogen is listed on the TSCA inventory.

OSHA: OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION:

29 CFR 1910.119: PROCESS SAFETY MANAGEMENT OF HIGHLY HAZARDOUS CHEMICALS: Requires facilities to develop a process safety management program based on Threshold Quantities (TQ) of highly hazardous chemicals.

Nitrogen is not listed in Appendix A as a highly hazardous chemical.

STATE REGULATIONS:

CALIFORNIA: Nitrogen is not listed by California under the SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986 (Proposition 65).

PENNSYLVANIA: Nitrogen is subject to the PENNSYLVANIA WORKER AND COMMUNITY RIGHT-TO-KNOW ACT (35 P.S. Sections 7301-7320).

16. Other Information

Be sure to read and understand all labels and instructions supplied with all containers of this product.

NOTE: *The suitability of nitrogen as a component in underwater breathing gas mixtures is to be determined by or under the supervision of personnel experienced in the use of underwater breathing gas mixtures and familiar with the physiological effects, methods employed, frequency and duration of use, hazards, side effects, and precautions to be taken.*

OTHER HAZARDOUS CONDITIONS OF HANDLING, STORAGE, AND USE: ***High-pressure gas. Use piping and equipment adequately designed to withstand pressures to be encountered.*** Use a blackflow prevention device in any piping. ***Gas can cause rapid suffocation because of oxygen deficiency.*** Store and use with adequate ventilation. ***Never work on a pressurized system.*** If there is a leak, close the cylinder valve. Blow the system down in a safe and environmentally sound manner in compliance with all federal, state, and local laws; then repair the leak. ***Never place a compressed gas cylinder where it may become part of an electrical circuit.***

Mixtures. When you mix two or more gases or liquefied gases, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Remember, gases and liquids have properties that can cause serious injury or death.

HAZARD RATING SYSTEMS:

NFPA RATINGS:		**HMIS RATINGS:**	
HEALTH	= 0	HEALTH	= 0
FLAMMABILITY	= 0	FLAMMABILITY	= 0
INSTABILITY	= 0	PHYSICAL HAZARD	= 3
SPECIAL	= SA (CGA recommends this to designate Simple Asphyxiant.)		

STANDARD VALVE CONNECTIONS FOR U.S. AND CANADA:

THREADED:	0-3000 psig	CGA-580
	3001-5500 psig	CGA-680
	5001-7500 psig.	CGA-677
PIN-INDEXED YOKE:	0-3000 psig	CGA-960 (medical use)
ULTRA-HIGH-INTEGRITY CONNECTION:	0-3000 psig	CGA-718

Use the proper CGA connections. **DO NOT USE ADAPTERS.** Additional limited-standard connections may apply. See CGA pamphlet V-1 listed below.

Ask your supplier about free Praxair safety literature as referred to in this MSDS and on the label for this product. Further information can be found in the following materials published by the Compressed Gas Association, Inc. (CGA), www.cganet.com.

AV-1	*Safe Handling and Storage of Compressed Gases*
G-10.1	*Commodity Specification for Nitrogen*
P-1	*Safe Handling of Compressed Gases in Containers*
P-9	*Inert Gases – Argon, Nitrogen, and Helium*
SB-2	*Oxygen-Deficient Atmospheres*
V-1	*Compressed Gas Cylinder Valve Inlet and Outlet Connections*
—	*Handbook of Compressed Gases*

Praxair asks users of this product to study this MSDS and become aware of product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this MSDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Praxair, Inc. We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and the conditions of use of the product are not within the control of Praxair, Inc., it is the user's obligation to determine the conditions of safe use of the product.

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PRAXAIR

Praxair, Inc.
39 Old Ridgebury Road
Danbury, CT 06810-5113

Printed in USA

Material Safety Data Sheet

Sulfur Hexafluoride

Section 1. Chemical product and company identification

Product name : Sulfur Hexafluoride

Supplier : AIRGAS INC., on behalf of its subsidiaries
259 North Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283
1-610-687-5253

Product use : Synthetic/Analytical chemistry.

Synonym : Sulfur fluoride; OC-6-11; Elegas; SF6; Hexafluorure de soufre; UN 1080; Esaflon

MSDS # : 001048

Date of Preparation/Revision : **4/25/2013.**

In case of emergency : 1-866-734-3438

Section 2. Hazards identification

Physical state : Gas. [COLORLESS, ODORLESS GAS. [NOTE: SHIPPED AS A LIQUEFIED COMPRESSED GAS. CONDENSES DIRECTLY TO A SOLID UPON COOLING.]]

Emergency overview : WARNING!

MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.
CONTENTS UNDER PRESSURE.

Do not puncture or incinerate container. May cause target organ damage, based on animal data.

Contact with rapidly expanding gases can cause frostbite.

Target organs : May cause damage to the following organs: upper respiratory tract.

Routes of entry : Inhalation

Potential acute health effects

Eyes : Contact with rapidly expanding gas may cause burns or frostbite.

Skin : Contact with rapidly expanding gas may cause burns or frostbite.

Inhalation : Acts as a simple asphyxiant.

Ingestion : Ingestion is not a normal route of exposure for gases

Potential chronic health effects

Target organs : May cause damage to the following organs: upper respiratory tract.

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

Section 3. Composition, Information on Ingredients

Name	CAS number	% Volume	Exposure limits
Sulfur Hexafluoride	2551-62-4	100	**ACGIH TLV (United States, 1/2009).** TWA: 5970 mg/m³ 8 hour(s). TWA: 1000 ppm 8 hour(s). **NIOSH REL (United States, 6/2009).** TWA: 6000 mg/m³ 10 hour(s). TWA: 1000 ppm 10 hour(s). **OSHA PEL (United States, 11/2006).** TWA: 6000 mg/m³ 8 hour(s). TWA: 1000 ppm 8 hour(s). **OSHA PEL 1989 (United States, 3/1989).** TWA: 6000 mg/m³ 8 hour(s). TWA: 1000 ppm 8 hour(s).

Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training.If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus.It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

Eye contact : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Frostbite : Try to warm up the frozen tissues and seek medical attention.

Inhalation : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion : As this product is a gas, refer to the inhalation section.

Section 5. Fire-fighting measures

Flammability of the product : Non-flammable.

Products of combustion : Decomposition products may include the following materials:
sulfur oxides
halogenated compounds

Fire-fighting media and instructions : Use an extinguishing agent suitable for the surrounding fire.

Apply water from a safe distance to cool container and protect surrounding area. If involved in fire, shut off flow immediately if it can be done without risk.

Contains gas under pressure. In a fire or if heated, a pressure increase will occur and the container may burst or explode.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Methods for cleaning up : Immediately contact emergency personnel. Stop leak if without risk. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

Handling : High pressure gas. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.

Storage : Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

Section 8. Exposure controls/personal protection

Engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Personal protection

Eyes : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Personal protection in case of a large spill : Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product.

Product name

sulphur hexafluoride

ACGIH TLV (United States, 1/2009).
TWA: 5970 mg/m³ 8 hour(s).
TWA: 1000 ppm 8 hour(s).
NIOSH REL (United States, 6/2009).
TWA: 6000 mg/m³ 10 hour(s).
TWA: 1000 ppm 10 hour(s).
OSHA PEL (United States, 11/2006).
TWA: 6000 mg/m³ 8 hour(s).
TWA: 1000 ppm 8 hour(s).
OSHA PEL 1989 (United States, 3/1989).
TWA: 6000 mg/m³ 8 hour(s).
TWA: 1000 ppm 8 hour(s).

Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

Molecular weight : 146.06 g/mole
Molecular formula : F6-S
Melting/freezing point : Sublimation temperature: -64.15°C (-83.5°F)
Critical temperature : 45.5°C (113.9°F)
Vapor pressure : 320 (psig)
Vapor density : 5.114 (Air = 1)
Specific Volume (ft ^{3}/lb) : 2.5994
Gas Density (lb/ft ^{3}) : 0.3847

Section 10. Stability and reactivity

Stability and reactivity : The product is stable.
Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Toxicity data

Chronic effects on humans : May cause damage to the following organs: upper respiratory tract.

Other toxic effects on humans : No specific information is available in our database regarding the other toxic effects of this material to humans.

Specific effects

Carcinogenic effects : No known significant effects or critical hazards.

Mutagenic effects : No known significant effects or critical hazards.

Reproduction toxicity : No known significant effects or critical hazards.

Section 12. Ecological information

Aquatic ecotoxicity

Not available.

Environmental fate : Not available.

Environmental hazards : No known significant effects or critical hazards.

Toxicity to the environment : Not available.

Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation.Return cylinders with residual product to Airgas, Inc.Do not dispose of locally.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN1080	SULFUR HEXAFLUORIDE	2.2	Not applicable (gas).		**Limited quantity** Yes. **Packaging instruction** **Passenger aircraft** Quantity limitation: 75 kg **Cargo aircraft** Quantity limitation: 150 kg
TDG Classification	UN1080	SULFUR HEXAFLUORIDE; OR SULPHUR HEXAFLUORIDE	2.2	Not applicable (gas).		**Explosive Limit and Limited Quantity Index** 0.125 **Passenger Carrying Road or Rail Index** 75

Sulfur Hexafluoride						
Mexico Classification	UN1080	SULFUR HEXAFLUORIDE	2.2	Not applicable (gas).		-

"Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product."

Section 15. Regulatory information

United States

U.S. Federal regulations : **United States inventory (TSCA 8b):** This material is listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: sulphur hexafluoride
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: sulphur hexafluoride: Sudden release of pressure

Clean Water Act (CWA) 307: No products were found.

Clean Water Act (CWA) 311: No products were found.

Clean Air Act (CAA) 112 regulated flammable substances: No products were found.

Clean Air Act (CAA) 112 regulated toxic substances: No products were found.

State regulations : **Connecticut Carcinogen Reporting:** This material is not listed.
Connecticut Hazardous Material Survey: This material is not listed.
Florida substances: This material is not listed.
Illinois Chemical Safety Act: This material is not listed.
Illinois Toxic Substances Disclosure to Employee Act: This material is not listed.
Louisiana Reporting: This material is not listed.
Louisiana Spill: This material is not listed.
Massachusetts Spill: This material is not listed.
Massachusetts Substances: This material is listed.
Michigan Critical Material: This material is not listed.
Minnesota Hazardous Substances: This material is not listed.
New Jersey Hazardous Substances: This material is listed.
New Jersey Spill: This material is not listed.
New Jersey Toxic Catastrophe Prevention Act: This material is not listed.
New York Acutely Hazardous Substances: This material is not listed.
New York Toxic Chemical Release Reporting: This material is not listed.
Pennsylvania RTK Hazardous Substances: This material is listed.
Rhode Island Hazardous Substances: This material is not listed.

Canada

WHMIS (Canada) : Class A: Compressed gas.

CEPA Toxic substances: This material is listed.
Canadian ARET: This material is not listed.
Canadian NPRI: This material is listed.
Alberta Designated Substances: This material is not listed.
Ontario Designated Substances: This material is not listed.
Quebec Designated Substances: This material is not listed.

Section 16. Other information

United States

Label requirements : MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.
CONTENTS UNDER PRESSURE.

Canada

Label requirements : Class A: Compressed gas.

Hazardous Material Information System (U.S.A.) :

Health	*	0
Flammability		0
Physical hazards		0

National Fire Protection Association (U.S.A.) :

Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.
Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Material Safety Data Sheet

CrossTrans 206

Revised: 1/08/09
MSDS #: CrossTrans

1. PRODUCT AND COMPANY IDENTIFICATION

Product Identifier: CrossTrans 206 **General Uses:** Electrical Insulating Oil.
Product Description: Amber Liquid, Hydrocarbon Odor.

MANUFACTURER:
Cross Oil Refining & Marketing, Inc.
484 East Sixth Street
Smackover, Arkansas 71762
MSDS prepared by: Clark B. Smith

EMERGENCY TELEPHONE NUMBERS

(870) 881-8700, Ext. 1163 [USA]

(870) 881-8700, Ext. 1128

2. COMPOSITION INFORMATION

			% Vol.
CHEMICAL FAMILY: Petroleum Hydrocarbon		**Common Name:** Naphthenic Oil	99.7 to 99.92%
		Antioxidant	0.3 to 0.08%
HAZARDOUS INGREDIENTS: None Known		**Exposure Limits (Oil Mist):**	**TWA**
		ACGIH,TLV(ppm)	5
CAS #: Grades < 100 SUS @ 100 F	64742-53-6	OSHA,PELS (ppm)	5
	128-39-2	NIOSH, TWA (ppm)	5

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

Clear light to dark amber liquid. Mild hydrocarbon odor. Can burn in a fire.

POTENTIAL HEALTH EFFECTS:

INHALATION: Will not produce vapors unless heated to temperatures of ~300 °F.
EYE CONTACT: Irritating, but will not permanently injure eye tissue.
SKIN CONTACT: Prolonged or repeated contact may cause skin irritation.
INGESTION: Small amounts (tablespoonful) swallowed are not likely to cause injury. Larger amounts may cause nausea and vomiting. Consult a physician promptly.
CHRONIC (CANCER) INFORMATION: IARC Monographs state that when laboratory animals are exposed to severely hydrotreated oils, such as these product(s), there is insufficient evidence for cancer. Thus, these oils are **Unlabeled** in accordance with 29 CFR 1910 .1200.

4. FIRST AID MEASURES

EYE CONTACT: Flush eyes with plenty of water for several minutes. Get medical attention if eye irritation persists.
SKIN: Wash skin with plenty of soap and water for several minutes. Get medical attention of skin irritation develops or persists.
INGESTION: If more than several mouthfuls have been swallowed, give two glasses of water (16 Oz.). Get medical attention.
INHALATION: If irritation, headache, nausea, or drowsiness occurs, remove to fresh air. Get medical attention if breathing becomes difficult or symptoms persist.

5. FIRE FIGHTING MEASURES

Flash Point, °C (Method)	See Section 9	(COC)
Ignition Temp.°F	Not Determined	
Flammability Limits (%)	Not Determined	

RECOMMENDED FIRE EXTINGUISHING AGENTS AND SPECIAL PROCEDURES

According to NFPA Guide, use water spray, dry chemical, foam, or carbon dioxide. Water or foam may cause frothing. Use water to cool fire exposed containers. If a leak or spill has not ignited, use water spray to disperse the vapors and to provide protection for persons attempting to stop the leak.

UNUSUAL OR EXPLOSIVE HAZARDS: None

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6. ACCIDENTAL RELEASE MEASURES

Notify the appropriate authorities immediately. Contain spill, if possible. Avoid breathing vapor. Use self-contained breathing apparatus or supplied air for large spills or in confined areas. Wipe up or use suitable absorbent material and shovel into appropriate container for disposal. Prevent entry into sewers or waterways. Avoid contact with skin, eyes or clothing.

---

7. HANDLING AND STORAGE

PRECAUTIONS: Minimum feasible handling temperatures should be maintained Periods of exposure to high temperature should be minimized. Water contamination should be avoided.

---

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION: Chemical-type goggles or face shield recommended to prevent eye exposure.

SKIN PROTECTION: Workers should wash exposed skin several times daily with soap and water. Soiled clothing should be laundered or dry-cleaned at least weekly.

RESPIRATORY PROTECTION: Airborne concentrations should by kept to lowest levels. If vapor is generated, use respirator approved by OSHA or NIOSH as appropriate. Supplied air respiratory protection should be used for cleaning large spills or upon entry into tanks, vessels, or other confined spaces. See Exposure Limit below.

VENTILATION: Must be adequate to meet exposure limits below.

EXPOSURE LIMIT (TOTAL PRODUCT)

5 mg/m3 for mineral oil mist over an 8 hour daily exposure (ACGIH).

---

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Bright ,clear liquid. Mineral odor.
% VOC: 100 (Can be totally burned)
FREEZING POINT: Not applicable
VAPOR PRESSURE: Insignificant @ atmospheric pressure
pH: Not available
SOLUBILITY IN WATER: Insoluble
VAPOR DENSITY (Air=1): 1+

GRADE	VISCOSITY, cSt @ 40 °C	FLASH, °C (COC)	SPECIFIC GRAVITY	PCA's (IP-346)	IBP, °C
206	9.58	152	.896	1.5	212

10. STABILITY AND REACTIVITY

- This material reacts violently with strong oxidizers.
- Evolves toxic levels of carbon monoxide, carbon dioxide irritating aldehydes and keytones when heated to combustion.
- Hazardous polymerization does not occur.

11. TOXICOLOGICAL INFORMATION

TOXOLOGICAL INFORMATION (ANIMAL TOXICITY DATA)

Median Lethal Dose (LD50 LC50) (Species)

Oral:	Believed to be >5g/kg (rat); practically non-toxic
Inhalation:	Not Determined
Dermal:	Believed to be >3 g/kg (rat); practically non-toxic.
Irritation Index:	Estimation of Irritation (Species).
Skin:	Believed to be <0.5/8.0 (rabbit); no appreciable effect
Eyes:	Believed to be <15/110 (rabbit); no appreciable effect
Sensitization:	Not Available
Other:	None

The International Agency for Research on Cancer (IARC), one of the Occupational Safety and Health Association's (OSHA) authorities for establishing carcinogenic potential, has specifically evaluated Naphthenic Oils. IARC found that Mildly Hydrotreated (Hydrofinished) Naphthenic Oils are carcinogenic to laboratory animals. **IARC has NOT found Severely Hydrotreated Naphthenic Oils to be carcinogenic. These products are classified as Severely (Not Mildly) Hydrotreated under both IARC and OSHA definitions.**

One refiner reports that a lifetime dermal application of this type oil produced skin masses on mice, which correlated with the skin irritation response levels of individual test animals. Additional studies attribute these masses to a weak promotional activity. These studies also showed that this product is not a mutagen, not a tumor initiator, and not a complete chemical carcinogen. Under normal anticipated conditions of use, this product should not present a risk to human health.

12. ECOLOGICAL INFORMATION

No data is available on the adverse effects of this material on the environment. A film or sheen will cause discoloration of the water surface or adjoining shoreline.

13. DISPOSAL CONSIDERATIONS

This product has been evaluated for RCRA characteristics and *does not* meet the criteria of a hazardous waste if discarded in its purchased form. Under RCRA it is the responsibility of the user of the product to determine at the time of disposal , whether the product meets RCRA criteria for hazardous waste. This product is subject in service to chemical alteration, which may render the resulting material hazardous.

14. TRANSPORT INFORMATION

	DOT		
PRODUCT	CLASS	PLACARD NO.	PACKAGING
Not App.	Not.App	Not App.	Not App.

15. REGULATORY INFORMATION

TSCA: All components of this material are listed in the U.S. TSCA Inventory.

OSHA: IARC Monographs state that when laboratory animals are exposed to severely hydrotreated oils, such as these products(s), there is insufficient evidence for cancer. Thus, these product are **Unlabeled** in accordance with 29 CFR 1910.1200

SARA TITLE III Section 302/304 Extremely Hazardous Substance None

Section 311 - EPA Hazard Categories

Immediate Health	*Delayed Health*	*Fire*	*Sudden Pressure Release*	*Reactive*
None	None	Minor > 250 °F	None	None

Section 313 Toxic Chemicals None

CERCLA Section 102(a) Hazardous Substance No Reportable Quantity (RQ) Substances

CANADIAN DOMESTIC SUBSTANCES LIST - - All components of this material are listed.

16. OTHER INFORMATION

Hazard Ratings Recommended for Containers

NFPA	HMIS
Fire 1	Health 1
Health 1	Flammability 1
Reactivity 0	Reactivity 0
Specific Hazard none	Personal Protection Index B

16. OTHER INFORMATION (CON'T)

This information is furnished without warranty, expressed or implied, except that it is accurate to the best knowledge of Cross Oil Refining & Marketing Company, Inc.. The data on this sheet is related only to the specific material designated herein. Cross Oil Refining & Marketing Co., Inc. assumes no legal responsibility for use or reliance upon these data.
NA = Not Available Not App. = Not Applicable

17.PRODUCT LABEL

Product Trade Name: CrossTrans 206 Date: 7/31/08

Tank Car Number: NA Cross Truck Loading Manifest No:NA

WARNING

Avoid Prolonged Breathing of Mist or Spray. Average exposure to airborne mist for an 8-hour workday should not exceed 5.0 milligrams of mist per cubic meter of air.

Avoid Eye and Skin Contact: Wear oil-impervious protective clothing. If clothes become contaminated, change to clean clothing after thoroughly washing exposed skin with soap and warm water.

FIRST AID

Inhalation: If overcome by fumes, remove from exposure immediately and call a physician.

Skin: Wash with warm water and soap until the exposed area is clean.

Eyes: Flush with water for at least fifteen (15) minutes. See physician if symptoms persist.

Ingestion: Do not induct vomiting. Obtain medical assistance. Small amounts that accidentally enter through the mouth should be rinsed out until no taste of it remains.

FIRE CONTROL

Use water spray or fog, chemical foam, dry powder or carbon dioxide.

SPILL / LEAK

Add absorbent (sand, sawdust, etc.) to the spill area. Contain spill. Advise State Environmental Protection Agency, if required. Put recovered material in an appropriate container and dispose of according to federal, state, and local regulations. For guidance call Cross Oil Refining & Marketing Co., Inc. at (870) 881-8700, Ext. 1163

STORAGE

Store in original or equivalent container. Store at the lowest practical temperature. Keep container closed when not in use. Do not apply heat or flame to the container

Solidification Products International
P.O. Box 35, 215 Village Street, Northford, CT 06472
Phone (203) 484-9494 Fax (203) 484-9492

Material Safety Data Sheet	**U.S. Department of Labor**
May be used to comply with OSHA's Hazard Communication Standard, 29 CFR 1910 1200. Standard must be consulted for specific requirements.	Occupational Safety and Health Administration (Non-Mandatory Form) Form Approved OMB No. 1218-0072
IDENTITY *(as Used on Label and List)* ***Petro-Barrier, Petro-plugs, Petro-Pipes Media***	*Note: Blank spaces are not permitted. If any item is not applicable or no information is available, the space must be marked to indicate that.*

Section I

Manufacturer's name **Solidification Products International.**	Emergency Telephone Number **203-484-9494**
Address *(Number, Street, City, State and ZIP Code)* **P.O. Box 35**	Telephone Number for Information **203-484-9494**
215 Village Street	Date Prepared **January 1, 2006**
Northford, CT 06472	Signature of Preparer *(optional)*

Section II—Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity, Common Name(s))	OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)

Chemical Family: Organic Polymer Mixture

Description : Blue Granules

This product is not hazardous as defined in 29CFR1910.1200

Section III—Physical/Chemical Characteristics

Boiling Point **NA**		Specific Gravity (H_20 = 1) **NA**	
Vapor Pressure (mm Hg) **NA**		Melting Point **NA**	
Vapor Density (AIR = 1) **NA**		Evaporation Rate (Butyl Acetate = 1) **NA**	

Solubility in Water **Insoluble**

Appearance and Odor **Blue granules, with little or no odor**

Section IV—Fire and Explosion Hazard Data

Flash Point (Method Used) **NA**	Flammable Limits **NA**	LEL **NA**	UEL **NA**

Extinguishing Media **Carbon dioxide, dry chemical , foam, Water spray**

Special Fire Fighting Procedures **Wear self contained breathing apparatus with full facepiece operated in a pressure demand mode. Also wear full protective clothing.**

Unusual Fire and Explosion Hazards **None**

Section V—Reactivity Data

Stability **Stable**	Unstable **NA**	Conditions to Avoid

Incompatibility *(Materials to Avoid)* **Strong oxidants such as liquid chlorine, enriched gaseous or liquid oxygen, and sodium or calcium hypochlorite.**

Hazardous Decomposition or Byproducts **Thermal decomposition may create carbon dioxide or carbon monoxide**

Hazardous Polymerization **Will not occur.**	May Occur **NA**	Conditions to Avoid

Section VI—Health Hazard Data

Nature of Principal Hazard(s): NA (not a health hazard as defined by OSHA)

Target Organ(s): NA

Signs, Symptoms, and Effects of Exposure: Eye contact may product slight irritation and/or redness. Inhaled dust may cause some respiratory irritation.

Carcinogenicity: Not listed as a carcinogen by IARC, NTP, OSHA, or ACGIH

Exposure Limits (as particulates not otherwise regulated): The OSHA 8-hour TWA for total dust is 15 mg/cu-meter (5 mg/cu-meter for the respirable fraction). The ACGIH TLV-TWA is 10/mg cu-meter.

Safety Precautions: Do not get in eyes, on skin, on clothing. Wash thoroughly after handling. Avoid prolonged or repeated inhalation of dust. Avoid prolonged or repeated skin contact. Caution – slip hazard – see sections IV and/or VII.

First Aid:

Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes. Call a physician

Ingestion: Consult a physician. Never give anything by mouth to an unconscious person.

Skin Contact: Remove contaminated clothing and launder before reuse. Wash effected area with soap and water.

Inhalation: Remove to fresh air.

Section VII—Precautions for Safe Handling and Use

Steps to Be Taken in Case Material Is Released or Spilled

Product becomes slippery and difficult to handle when wet/ spills are best handled while still dry. Sweep up and collect dry product. Absorb wet product with vermiculite or other inert material. Then water wash area to waste treatment to eliminate slip hazard.

Waste Disposal Method

Disposal must be arranged in accordance with local, state, and federal regulations. This material, when unadulterated, is not a RCRA regulated hazardous waste. However, local disposal regulations will often apply. Care must be taken to prevent environmental contamination from the disposal of material, residues and containers.

Precautions to Be Taken in Handling and Storing

Section VII—Control Measures

Respiratory Protection *(Specify Type)* **Use a NIOSH approved dust respirator if exposure exceeds TLV. Follow the ANSI Z88.2 standard.**

Ventilation Local Exhaust

Mechanical *(General)* **Provide mechanical ventilation to prevent dust concentrations, and to reduce potential exposure**

Protective Gloves	Eye Protection
Not normally required	**Goggles (ANSI Z87.1 std; safety glasses alone do not protect from dust).**

Work/Hygienic Practices

Good personal hygiene practices can reduce potential exposure. Wash with soap and water following any contact with this product, as well as before breaks and meals. Shower and Change clothing at end of work shift. If clothing becomes contaminated, remove and launder or dry-clean before re-use.

PHOENIX
Environmental Laboratories, Inc

Monday, October 28, 2013

Solidification Products
215 Village St
Northford, CT 06472

Project ID: TREATMENT STUDY - MA DEP
Sample ID#s: BF65897

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Telephone (860) 645-1102 Fax (860) 645-0823

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 28, 2013

FOR: Solidification Products
215 Village St
Northford, CT 06472

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:	PHOENIX	10/21/13	11:00
Location Code:	SOLPROD	Received by:	LB	10/21/13	11:01
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBF65897
Phoenix ID: BF65897

Project ID: TREATMENT STUDY - MA DEP
Client ID: 50 % OIL/WATER TREATED

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
EPH Extraction	Completed			10/22/13	K	3510
MA Petroleum Hydrocarbon (EPH)	Completed			10/26/13		MADEP EPH-04
MA EPH Aliphatic/Aromatic Ranges						
C11-C22 Aromatic Hydrocarbons 1,2*	2500	100	ug/L	10/26/13	BB	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	1800	100	ug/L	10/26/13	BB	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	3100	100	ug/L	10/26/13	BB	MAEPH 5/2004
Total TPH 1*	7400	100	ug/L	10/26/13	BB	MAEPH 5/2004
QA/QC Surrogates						
% 1-chlorooctadecane (aliphatic)	55		%	10/26/13	BB	MAEPH 5/2004
% 2-Bromonaphthalene (Fractionation)	120		%	10/26/13	BB	MAEPH 5/2004
% 2-Fluorobiphenyl (Fractionation)	80		%	10/26/13	BB	MAEPH 5/2004
% o-terphenyl (aromatic)	120		%	10/26/13	BB	MAEPH 5/2004
EPH Diesel PAH Target Analytes						
2-Methyl Naphthalene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
Acenaphthene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
Naphthalene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
Phenanthrene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
EPH Other PAH Target Analytes						
Acenapthylene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
Anthracene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
Benzo(a)anthracene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
Benzo(a)pyrene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
Benzo(b)fluoranthene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
Benzo(ghi)perylene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
Benzo(k)fluoranthene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
Chrysene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004

Project ID: TREATMENT STUDY - MA DEP
Client ID: 50 % OIL/WATER TREATED

Phoenix I.D.: BF65897

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Dibenzo(a,h)anthracene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
Fluoranthene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
Fluorene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
Indeno(1,2,3-cd)pyrene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004
Pyrene	<10	10	ug/L	10/26/13	BB	MAEPH 5/2004

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

MAEPH:
1* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.
2* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
October 28, 2013
Reviewed and Released by: Greg Lawrence, Assistant Lab Director

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

October 28, 2013

QA/QC Data

SDG I.D.: GBF65897

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 257045, QC Sample No: BF52851 (BF65897)									
MAEPH - Waste Water									
Acenaphthylene - Water	ND	59	63	6.6				40 - 140	20
Anthracene - Water	ND	71	74	4.1				40 - 140	20
Benzo(a)anthracene - Water	ND	80	82	2.5				40 - 140	20
Benzo(a)pyrene - Water	ND	79	79	0.0				40 - 140	20
Benzo(b)fluoranthene - Water	ND	80	80	0.0				40 - 140	20
Benzo(ghi)perylene - Water	ND	75	77	2.6				40 - 140	20
Benzo(k)fluoranthene - Water	ND	80	80	0.0				40 - 140	20
C11-C22 Aromatic Hydrocarbons - Wate	ND	72	75	4.1				40 - 140	20
C19-C36 Aliphatic Hydrocarbons - Wate	ND	75	70	6.9				40 - 140	20
C9-C18 Aliphatic Hydrocarbons - Water	ND	41	42	2.4				40 - 140	20
Chrysene - Water	ND	77	78	1.3				40 - 140	20
Dibenz(a,h)anthracene - Water	ND	77	79	2.6				40 - 140	20
Fluoranthene - Water	ND	77	80	3.8				40 - 140	20
Fluorene - Water	ND	70	74	5.6				40 - 140	20
Indeno(1,2,3-cd)pyrene - Water	ND	77	79	2.6				40 - 140	20
Pyrene - Water	ND	85	92	7.9				40 - 140	20
% 2-Methylnaphthalene BT - Water		0	0	NC				0 - 5	
% Naphthalene BT - Water		0	0	NC				0 - 5	
%2-Bromonaphthalene (surr) - Water	75	66	70	5.9				40 - 140	20
%2-Flurobiphenyl (surr) - Water	76	67	72	7.2				40 - 140	20
%o-COD (surr) - Water	51	58	49	16.8				40 - 140	20
%o-Terphenyl (surr) - Water	66	61	64	4.8				40 - 140	20

Comment:

Additional EPH fractionation criteria: Breakthrough criteria (BT) is 0 to 5%

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
October 28, 2013

Monday, October 28, 2013

Requested Criteria: None

State: CT

Sample Criteria Exceedences Report

GBF65897 - SOLPROD

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

Monday, October 28, 2013

PHOENIX

EPH Fractionation Standard

SDG I.D.: GBF65897

Effective Date(s): 01/09/13 - 01/09/14 **Analyst:**

AS #	TV	#1	#2	#3	#4	Avg	% Rec	% RSD	Rec Limits	RSD Limits
Naphthalene	10	6.79	7.06	7.12	6.83	6.95	69.5	2.4	40-140	20
2-Methylnaphthalene	10	6.68	7.12	7.27	6.96	7.01	70.1	3.6	40-140	20
Acenaphthalene	10	7.17	7.70	8.16	7.41	7.61	76.1	5.6	40-140	20
Acenaphthene	10	8.02	8.43	8.81	8.14	8.35	83.5	4.2	40-140	20
Fluorene	10	7.96	8.64	8.78	8.23	8.40	84.0	4.5	40-140	20
Phenanthrene	10	8.85	9.37	9.59	9.02	9.21	92.1	3.6	40-140	20
Anthracene	10	14.10	15.20	15.40	14.50	14.80	148.0	4.1	40-140	20
Fluoranthene	10	10.10	10.20	10.40	10.20	10.23	102.3	1.2	40-140	20
Pyrene	10	9.60	10.10	10.50	10.00	10.05	100.5	3.7	40-140	20
Benzo(a)anthracene	10	10.10	10.40	10.60	10.40	10.38	103.8	2.0	40-140	20
Chrysene	10	9.88	10.10	10.60	10.20	10.20	102.0	3.0	40-140	20
Benzo(b)fluoranthene	10	9.95	9.66	11.40	10.60	10.40	104.0	7.4	40-140	20
Benzo(k)fluoranthene	10	9.57	10.00	9.35	9.23	9.54	95.4	3.6	40-140	20
Benzo(a)pyrene	10	9.07	9.15	9.78	9.27	9.32	93.2	3.4	40-140	20
Indeno(123cd)pyrene	10	9.10	9.54	10.00	9.88	9.63	96.3	4.2	40-140	20
Dibenz(ah)anthracene	10	9.80	9.70	10.30	9.54	9.84	98.4	3.3	40-140	20
Benzo(ghi)perylene	10	9.60	9.70	10.20	9.75	9.81	98.1	2.7	40-140	20
Nonane c9	10	3.68	3.80	3.91	3.61	3.75	37.5	3.5	25-140	20
Decane c10	10	5.16	5.46	6.04	5.15	5.45	54.5	7.7	40-140	20
Dodecane c12	10	6.12	6.50	6.31	6.25	6.30	63.0	2.5	40-140	20
Tetradecane c14	10	7.48	7.92	8.40	7.76	7.89	78.9	4.9	40-140	20
Hexadecane c16	10	8.69	9.23	9.86	9.10	9.22	92.2	5.3	40-140	20
Octadecane c18	10	9.92	10.70	11.10	10.80	10.63	106.3	4.7	40-140	20
Eicosane c20	10	10.00	10.90	11.20	10.80	10.73	107.3	4.8	40-140	20
Henecosane c21	10	9.82	10.90	11.20	10.70	10.66	106.6	0.6	40-140	20
Docosane c22	10	10.10	11.20	11.50	10.90	10.93	109.3	5.5	40-140	20
Tetracosane c24	10	10.10	11.30	11.50	10.90	10.95	109.5	5.7	40-140	20
Hexacosane c26	10	9.92	11.10	11.40	10.70	10.78	107.8	6.0	40-140	20
Octacosane c28	10	9.46	10.70	11.00	10.30	10.37	103.7	6.4	40-140	20
Tricotane c30	10	9.24	10.60	10.80	10.20	10.21	102.1	6.8	40-140	20
Dotriacontane c32	10	8.68	9.88	10.20	9.51	9.57	95.7	0.7	40-140	20

Monday, October 28, 2013

PHOENIX

EPH Fractionation Standard

SDG I.D.: GBF65897

Effective Date(s): 01/09/13 - 01/09/14 **Analyst:**

AS #	TV	#1	#2	#3	#4	Avg	% Rec	% RSD	Rec Limits	RSD Limits
Tetratriacontane c34	10	8.44	9.84	10.10	9.65	9.51	95.1	0.7	40-140	20
Hexatriacontane c36	10	7.70	8.96	9.35	8.80	8.70	87.0	8.1	40-140	20
Octatriacontane c38	10	6.56	7.98	8.20	7.97	7.68	76.8	0.8	40-140	20
Tetracontane c40	10	6.52	7.39	7.63	7.60	7.29	72.9	0.5	40-140	20
c9-c12 Aliphatic	30	14.90	15.70	10.00	14.90	13.88	46.3	2.6	25-140	20
c12-c16 Aliphatic	20	16.10	17.10	18.20	16.80	17.05	85.3	0.9	40-140	20
c16-c21 Aliphatic	30	29.80	32.40	33.50	32.40	32.03	106.8	1.6	40-140	20
c21-c40 Aliphatic	100	88.40	101.00	103.00	97.90	97.58	97.6	6.5	40-140	20

Cooler: Yes ☐ No ☒
Coolant: IPK ☐ ICE ☐ No ☒

CHAIN OF CUSTODY RECORD

Temp 21 °C Pg of

PHOENIX Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Contact Options:
☐ Fax:
☐ Phone:
☐ Email:

Customer: Solidification Products
Address: 215 Village Street
Northford, CT 06472

Project: Treatment Study ME-DEP
Report to: Bill Gannon
Invoice to:

Project P.O:

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature: [signature] Date: 10/21/13

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe
OIL=Oil **B**=Bulk **L**=Liquid

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	EPH with Target	1000ml soil-class HCl	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container ( ) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [ ] HCl	GL Amber 1000ml [✓] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle
65897	50% oil/water Treated	WW	10/21/13	1100	X	1					1					

Relinquished by:	Accepted by:	Date:	Time:
[signature]	CParadise	10/21/13	11:01

Comments, Special Requirements or Regulations:

Turnaround:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☐ Standard
☐ Other
* SURCHARGE APPLIES

RI
☐ Direct Exposure (Residential)
☐ GW
☐ Other

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1
☐ S-2
☐ S-3
☐ MWRA eSMART
☐ Other

Data Format
☐ Excel
☐ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☐ Phoenix Std Report
☐ Other

State where samples were collected: _____

* SURCHARGE APPLIES

PHOENIX
Environmental Laboratories, Inc

Wednesday, October 23, 2013

Solidification Products
215 Village St
Northford, CT 06472

Project ID: TREATED FOR ME-DEP
Sample ID#s: BF52851 - BF52859

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Telephone (860) 645-1102 Fax (860) 645-0823

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 23, 2013

FOR: Solidification Products
215 Village St
Northford, CT 06472

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:	PHOENIX	10/11/13	11:00
Location Code:	SOLPROD	Received by:	SW	10/11/13	13:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBF52851
Phoenix ID: BF52851

Project ID: TREATED FOR ME-DEP
Client ID: TRANSFORMER OIL/WATER

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
EPH Extraction	Completed			10/15/13	W/D	3510
MA Petroleum Hydrocarbon (EPH)	Completed			10/17/13		MADEP EPH-04
MA EPH Aliphatic/Aromatic Ranges						
C11-C22 Aromatic Hydrocarbons 1,2*	5900	100	ug/L	10/17/13	BB	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	16000	100	ug/L	10/17/13	BB	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	13000	100	ug/L	10/17/13	BB	MAEPH 5/2004
Total TPH 1*	35000	100	ug/L	10/17/13	BB	MAEPH 5/2004
QA/QC Surrogates						
% 1-chlorooctadecane (aliphatic)	61		%	10/17/13	BB	MAEPH 5/2004
% 2-Bromonaphthalene (Fractionation)	79		%	10/17/13	BB	MAEPH 5/2004
% 2-Fluorobiphenyl (Fractionation)	72		%	10/17/13	BB	MAEPH 5/2004
% o-terphenyl (aromatic)	74		%	10/17/13	BB	MAEPH 5/2004
EPH Diesel PAH Target Analytes						
2-Methyl Naphthalene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
Acenaphthene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
Naphthalene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
Phenanthrene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
EPH Other PAH Target Analytes						
Acenapthylene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
Anthracene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
Benzo(a)anthracene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
Benzo(a)pyrene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
Benzo(b)fluoranthene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
Benzo(ghi)perylene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
Benzo(k)fluoranthene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
Chrysene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004

Project ID: TREATED FOR ME-DEP

Client ID: TRANSFORMER OIL/WATER

Phoenix I.D.: BF52851

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Dibenzo(a,h)anthracene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
Fluoranthene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
Fluorene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
Indeno(1,2,3-cd)pyrene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004
Pyrene	<10	10	ug/L	10/17/13	BB	MAEPH 5/2004

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

MAEPH:
1* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.
2* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

Sample was spiked with between 15 mg/L and 25 mg/l of Transformer Oil. This was to simulate an oil sheen.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
October 23, 2013
Reviewed and Released by: Greg Lawrence, Assistant Lab Director

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 23, 2013

FOR: Solidification Products
215 Village St
Northford, CT 06472

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:	PHOENIX	10/11/13	11:00
Location Code:	SOLPROD	Received by:	SW	10/11/13	13:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBF52851
Phoenix ID: BF52852

Project ID: TREATED FOR ME-DEP
Client ID: DIESEL FUEL/WATER

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
EPH Extraction	Completed			10/15/13	W/D	3510
MA Petroleum Hydrocarbon (EPH)	Completed			10/17/13		MADEP EPH-04
MA EPH Aliphatic/Aromatic Ranges						
C11-C22 Aromatic Hydrocarbons 1,2*	740	500	ug/L	10/17/13	BB	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	6600	500	ug/L	10/17/13	BB	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	15000	500	ug/L	10/17/13	BB	MAEPH 5/2004
Total TPH 1*	23000	500	ug/L	10/17/13	BB	MAEPH 5/2004
QA/QC Surrogates						
% 1-chlorooctadecane (aliphatic)	diluted out		%	10/17/13	BB	MAEPH 5/2004
% 2-Bromonaphthalene (Fractionation)	diluted out		%	10/17/13	BB	MAEPH 5/2004
% 2-Fluorobiphenyl (Fractionation)	diluted out		%	10/17/13	BB	MAEPH 5/2004
% o-terphenyl (aromatic)	diluted out		%	10/17/13	BB	MAEPH 5/2004
EPH Diesel PAH Target Analytes						
2-Methyl Naphthalene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
Acenaphthene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
Naphthalene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
Phenanthrene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
EPH Other PAH Target Analytes						
Acenapthylene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
Anthracene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
Benzo(a)anthracene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
Benzo(a)pyrene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
Benzo(b)fluoranthene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
Benzo(ghi)perylene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
Benzo(k)fluoranthene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
Chrysene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004

Project ID: TREATED FOR ME-DEP
Client ID: DIESEL FUEL/WATER

Phoenix I.D.: BF52852

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Dibenzo(a,h)anthracene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
Fluoranthene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
Fluorene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
Indeno(1,2,3-cd)pyrene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004
Pyrene	<50	50	ug/L	10/17/13	BB	MAEPH 5/2004

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

MAEPH:
1* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.
2* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

Sample was spiked with between 15 mg/L and 25 mg/l of Diesel Fuel. This was to simulate an oil sheen.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director
October 23, 2013
Reviewed and Released by: Greg Lawrence, Assistant Lab Director

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 23, 2013

FOR: Solidification Products
215 Village St
Northford, CT 06472

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:	PHOENIX	10/11/13	11:00
Location Code:	SOLPROD	Received by:	SW	10/11/13	13:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBF52851
Phoenix ID: BF52853

Project ID: TREATED FOR ME-DEP
Client ID: TRANSFORMER OIL/WATER TREATED

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
EPH Extraction	Completed			10/15/13	W/D	3510
MA Petroleum Hydrocarbon (EPH)	Completed			10/15/13		MADEP EPH-04
MA EPH Aliphatic/Aromatic Ranges						
C11-C22 Aromatic Hydrocarbons 1,2*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
Total TPH 1*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
QA/QC Surrogates						
% 1-chlorooctadecane (aliphatic)	68		%	10/15/13	BB	MAEPH 5/2004
% 2-Bromonaphthalene (Fractionation)	90		%	10/15/13	BB	MAEPH 5/2004
% 2-Fluorobiphenyl (Fractionation)	68		%	10/15/13	BB	MAEPH 5/2004
% o-terphenyl (aromatic)	93		%	10/15/13	BB	MAEPH 5/2004
EPH Diesel PAH Target Analytes						
2-Methyl Naphthalene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Acenaphthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Naphthalene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Phenanthrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
EPH Other PAH Target Analytes						
Acenapthylene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Anthracene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(a)anthracene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(a)pyrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(b)fluoranthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(ghi)perylene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(k)fluoranthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Chrysene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004

Project ID: TREATED FOR ME-DEP

Client ID: TRANSFORMER OIL/WATER TREATED

Phoenix I.D.: BF52853

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Dibenzo(a,h)anthracene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Fluoranthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Fluorene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Indeno(1,2,3-cd)pyrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Pyrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

MAEPH:
1* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.
2* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

Sample was spiked with between 15 mg/L and 25 mg/l of Transformer Oil. This was to simulate an oil sheen.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director
October 23, 2013
Reviewed and Released by: Greg Lawrence, Assistant Lab Director

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 23, 2013

FOR: Solidification Products
215 Village St
Northford, CT 06472

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:	PHOENIX	10/11/13	11:00
Location Code:	SOLPROD	Received by:	SW	10/11/13	13:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBF52851
Phoenix ID: BF52854

Project ID: TREATED FOR ME-DEP
Client ID: TRANSFORMER OIL/WATER TREATED DUP

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
EPH Extraction	Completed			10/15/13	W/D	3510
MA Petroleum Hydrocarbon (EPH)	Completed			10/15/13		MADEP EPH-04
MA EPH Aliphatic/Aromatic Ranges						
C11-C22 Aromatic Hydrocarbons 1,2*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
Total TPH 1*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
QA/QC Surrogates						
% 1-chlorooctadecane (aliphatic)	63		%	10/15/13	BB	MAEPH 5/2004
% 2-Bromonaphthalene (Fractionation)	80		%	10/15/13	BB	MAEPH 5/2004
% 2-Fluorobiphenyl (Fractionation)	64		%	10/15/13	BB	MAEPH 5/2004
% o-terphenyl (aromatic)	83		%	10/15/13	BB	MAEPH 5/2004
EPH Diesel PAH Target Analytes						
2-Methyl Naphthalene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Acenaphthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Naphthalene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Phenanthrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
EPH Other PAH Target Analytes						
Acenapthylene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Anthracene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(a)anthracene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(a)pyrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(b)fluoranthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(ghi)perylene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(k)fluoranthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Chrysene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004

Project ID: TREATED FOR ME-DEP

Phoenix I.D.: BF52854

Client ID: TRANSFORMER OIL/WATER TREATED DUP

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Dibenzo(a,h)anthracene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Fluoranthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Fluorene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Indeno(1,2,3-cd)pyrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Pyrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

MAEPH:
1* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.
2* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

Sample was spiked with between 15 mg/L and 25 mg/l of Transformer Oil. This was to simulate an oil sheen.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director
October 23, 2013
Reviewed and Released by: Greg Lawrence, Assistant Lab Director

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 23, 2013

FOR: Solidification Products
215 Village St
Northford, CT 06472

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:	PHOENIX	10/11/13	11:00
Location Code:	SOLPROD	Received by:	SW	10/11/13	13:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBF52851
Phoenix ID: BF52855

Project ID: TREATED FOR ME-DEP
Client ID: DIESEL FUEL/WATER TREATED

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
EPH Extraction	Completed			10/15/13	W/D	3510
MA Petroleum Hydrocarbon (EPH)	Completed			10/15/13		MADEP EPH-04
MA EPH Aliphatic/Aromatic Ranges						
C11-C22 Aromatic Hydrocarbons 1,2*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
Total TPH 1*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
QA/QC Surrogates						
% 1-chlorooctadecane (aliphatic)	57		%	10/15/13	BB	MAEPH 5/2004
% 2-Bromonaphthalene (Fractionation)	75		%	10/15/13	BB	MAEPH 5/2004
% 2-Fluorobiphenyl (Fractionation)	58		%	10/15/13	BB	MAEPH 5/2004
% o-terphenyl (aromatic)	79		%	10/15/13	BB	MAEPH 5/2004
EPH Diesel PAH Target Analytes						
2-Methyl Naphthalene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Acenaphthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Naphthalene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Phenanthrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
EPH Other PAH Target Analytes						
Acenapthylene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Anthracene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(a)anthracene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(a)pyrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(b)fluoranthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(ghi)perylene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(k)fluoranthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Chrysene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004

Project ID: TREATED FOR ME-DEP
Client ID: DIESEL FUEL/WATER TREATED

Phoenix I.D.: BF52855

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Dibenzo(a,h)anthracene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Fluoranthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Fluorene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Indeno(1,2,3-cd)pyrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Pyrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

MAEPH:
1* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.
2* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

Sample was spiked with between 15 mg/L and 25 mg/l of Diesel Fuel. This was to simulate an oil sheen.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director
October 23, 2013
Reviewed and Released by: Greg Lawrence, Assistant Lab Director

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 23, 2013

FOR: Solidification Products
215 Village St
Northford, CT 06472

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:	PHOENIX	10/11/13	11:00
Location Code:	SOLPROD	Received by:	SW	10/11/13	13:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBF52851
Phoenix ID: BF52856

Project ID: TREATED FOR ME-DEP
Client ID: DIESEL FUEL/WATER TREATED DUP

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
EPH Extraction	Completed			10/15/13	W/D	3510
MA Petroleum Hydrocarbon (EPH)	Completed			10/15/13		MADEP EPH-04
MA EPH Aliphatic/Aromatic Ranges						
C11-C22 Aromatic Hydrocarbons 1,2*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
C19-C36 Aliphatic Hydrocarbons 1*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
C9-C18 Aliphatic Hydrocarbons 1*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
Total TPH 1*	<100	100	ug/L	10/15/13	BB	MAEPH 5/2004
QA/QC Surrogates						
% 1-chlorooctadecane (aliphatic)	59		%	10/15/13	BB	MAEPH 5/2004
% 2-Bromonaphthalene (Fractionation)	77		%	10/15/13	BB	MAEPH 5/2004
% 2-Fluorobiphenyl (Fractionation)	59		%	10/15/13	BB	MAEPH 5/2004
% o-terphenyl (aromatic)	85		%	10/15/13	BB	MAEPH 5/2004
EPH Diesel PAH Target Analytes						
2-Methyl Naphthalene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Acenaphthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Naphthalene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Phenanthrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
EPH Other PAH Target Analytes						
Acenapthylene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Anthracene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(a)anthracene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(a)pyrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(b)fluoranthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(ghi)perylene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Benzo(k)fluoranthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Chrysene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004

Project ID: TREATED FOR ME-DEP

Phoenix I.D.: BF52856

Client ID: DIESEL FUEL/WATER TREATED DUP

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
Dibenzo(a,h)anthracene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Fluoranthene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Fluorene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Indeno(1,2,3-cd)pyrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004
Pyrene	<10	10	ug/L	10/15/13	BB	MAEPH 5/2004

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

MAEPH:
1* Hydrocarbon range data exclude concentrations of any surrogate(s) and/or internal standards eluting in that range.
2* C11-C12 Aromatic Hydrocarbons exclude the concentration of Target PAH analytes eluting in that range.

Sample was spiked with between 15 mg/L and 25 mg/l of Diesel Fuel. This was to simulate an oil sheen.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director
October 23, 2013
Reviewed and Released by: Greg Lawrence, Assistant Lab Director

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 23, 2013

FOR: Solidification Products
215 Village St
Northford, CT 06472

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:	PHOENIX	10/11/13	11:00
Location Code:	SOLPROD	Received by:	SW	10/11/13	13:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBF52851
Phoenix ID: BF52857

Project ID: TREATED FOR ME-DEP
Client ID: PCB WATER TREATED

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
PCB Extraction	Completed			10/14/13	L/T	SW3510C
Polychlorinated Biphenyls						
PCB-1016	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1221	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1232	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1242	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1248	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1254	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1260	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1262	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1268	ND	0.56	ug/L	10/16/13	AW	E608
QA/QC Surrogates						
% DCBP	75		%	10/16/13	AW	30 - 150 %
% TCMX	92		%	10/16/13	AW	30 - 150 %

Project ID: TREATED FOR ME-DEP
Client ID: PCB WATER TREATED

Phoenix I.D.: BF52857

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The sample was spiked with 1 ml of oil that had a concentration of 35.6 mg/kg of Aroclor 1248.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director
October 23, 2013
Reviewed and Released by: Greg Lawrence, Assistant Lab Director

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 23, 2013

FOR: Solidification Products
215 Village St
Northford, CT 06472

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:	PHOENIX	10/11/13	11:00
Location Code:	SOLPROD	Received by:	SW	10/11/13	13:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBF52851
Phoenix ID: BF52858

Project ID: TREATED FOR ME-DEP
Client ID: PCB WATER TREATED DUP

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
PCB Extraction	Completed			10/14/13	L/T	SW3510C
Polychlorinated Biphenyls						
PCB-1016	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1221	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1232	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1242	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1248	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1254	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1260	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1262	ND	0.56	ug/L	10/16/13	AW	E608
PCB-1268	ND	0.56	ug/L	10/16/13	AW	E608
QA/QC Surrogates						
% DCBP	84		%	10/16/13	AW	30 - 150 %
% TCMX	105		%	10/16/13	AW	30 - 150 %

Project ID: TREATED FOR ME-DEP

Client ID: PCB WATER TREATED DUP

Phoenix I.D.: BF52858

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The sample was spiked with 1 ml of oil that had a concentration of 35.6 mg/kg of Aroclor 1248.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director

October 23, 2013

Reviewed and Released by: Greg Lawrence, Assistant Lab Director

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Tel. (860) 645-1102 Fax (860) 645-0823

Analysis Report

October 23, 2013

FOR: Solidification Products
215 Village St
Northford, CT 06472

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:	PHOENIX	10/11/13	11:00
Location Code:	SOLPROD	Received by:	SW	10/11/13	13:00
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:					

Laboratory Data

SDG ID: GBF52851
Phoenix ID: BF52859

Project ID: TREATED FOR ME-DEP
Client ID: PCB WATER TREATED TRIPLICATE

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference
PCB Extraction	Completed			10/14/13	L/T	SW3510C
Polychlorinated Biphenyls						
PCB-1016	ND	0.67	ug/L	10/16/13	AW	E608
PCB-1221	ND	0.67	ug/L	10/16/13	AW	E608
PCB-1232	ND	0.67	ug/L	10/16/13	AW	E608
PCB-1242	ND	0.67	ug/L	10/16/13	AW	E608
PCB-1248	ND	0.67	ug/L	10/16/13	AW	E608
PCB-1254	ND	0.67	ug/L	10/16/13	AW	E608
PCB-1260	ND	0.67	ug/L	10/16/13	AW	E608
PCB-1262	ND	0.67	ug/L	10/16/13	AW	E608
PCB-1268	ND	0.67	ug/L	10/16/13	AW	E608
QA/QC Surrogates						
% DCBP	71		%	10/16/13	AW	30 - 150 %
% TCMX	103		%	10/16/13	AW	30 - 150 %

Project ID: TREATED FOR ME-DEP

Phoenix I.D.: BF52859

Client ID: PCB WATER TREATED TRIPLICATE

Parameter	Result	RL/ PQL	Units	Date/Time	By	Reference

RL/PQL=Reporting/Practical Quantitation Level ND=Not Detected BRL=Below Reporting Level

Comments:

The sample was spiked with 1 ml of oil that had a concentration of 35.6 mg/kg of Aroclor 1248.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
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Phyllis Shiller, Laboratory Director
October 23, 2013
Reviewed and Released by: Greg Lawrence, Assistant Lab Director

PHOENIX

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Tel. (860) 645-1102 Fax (860) 645-0823

QA/QC Report

October 23, 2013

QA/QC Data

SDG I.D.: GBF52851

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 256829, QC Sample No: BF52606 (BF52857, BF52858, BF52859)									
Polychlorinated Biphenyls - Waste Water									
PCB-1016	ND	105	111	5.6				40 - 140	20
PCB-1221	ND							40 - 140	20
PCB-1232	ND							40 - 140	20
PCB-1242	ND							40 - 140	20
PCB-1248	ND							40 - 140	20
PCB-1254	ND							40 - 140	20
PCB-1260	ND	105	114	8.2				40 - 140	20
PCB-1262	ND							40 - 140	20
PCB-1268	ND							40 - 140	20
% DCBP (Surrogate Rec)	77	70	79	12.1				30 - 150	20
% TCMX (Surrogate Rec)	85	97	100	3.0				30 - 150	20

Comment:

A LCS and LCS Duplicate were performed instead of a matrix spike and matrix spike duplicate.

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 257045, QC Sample No: BF52851 (BF52851, BF52852, BF52853, BF52854, BF52855, BF52856)									
MAEPH - Waste Water									
Acenaphthylene - Water	ND	59	63	6.6				40 - 140	20
Anthracene - Water	ND	71	74	4.1				40 - 140	20
Benzo(a)anthracene - Water	ND	80	82	2.5				40 - 140	20
Benzo(a)pyrene - Water	ND	79	79	0.0				40 - 140	20
Benzo(b)fluoranthene - Water	ND	80	80	0.0				40 - 140	20
Benzo(ghi)perylene - Water	ND	75	77	2.6				40 - 140	20
Benzo(k)fluoranthene - Water	ND	80	80	0.0				40 - 140	20
C11-C22 Aromatic Hydrocarbons - Wate	ND	72	75	4.1				40 - 140	20
C19-C36 Aliphatic Hydrocarbons - Wate	ND	75	70	6.9				40 - 140	20
C9-C18 Aliphatic Hydrocarbons - Water	ND	41	42	2.4				40 - 140	20
Chrysene - Water	ND	77	78	1.3				40 - 140	20
Dibenz(a,h)anthracene - Water	ND	77	79	2.6				40 - 140	20
Fluoranthene - Water	ND	77	80	3.8				40 - 140	20
Fluorene - Water	ND	70	74	5.6				40 - 140	20
Indeno(1,2,3-cd)pyrene - Water	ND	77	79	2.6				40 - 140	20
Pyrene - Water	ND	85	92	7.9				40 - 140	20
% 2-Methylnaphthalene BT - Water		0	0	NC				0 - 5	
% Naphthalene BT - Water		0	0	NC				0 - 5	
%2-Bromonaphthalene (surr) - Water	75	66	70	5.9				40 - 140	20
%2-Flurobiphenyl (surr) - Water	76	67	72	7.2				40 - 140	20
%o-COD (surr) - Water	51	58	49	16.8				40 - 140	20
%o-Terphenyl (surr) - Water	66	61	64	4.8				40 - 140	20

Comment:

Additional EPH fractionation criteria: Breakthrough criteria (BT) is 0 to 5%

QA/QC Data

SDG I.D.: GBF52851

Parameter	Blank	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
October 23, 2013

Wednesday, October 23, 2013

Requested Criteria: None

State: CT

Sample Criteria Exceedences Report

GBF52851 - SOLPROD

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Phoenix Laboratories does not assume responsibility for the data contained in this report. It is provided as an additional tool to identify requested criteria exceedences. All efforts are made to ensure the accuracy of the data (obtained from appropriate agencies). A lack of exceedence information does not necessarily suggest conformance to the criteria. It is ultimately the site professional's responsibility to determine appropriate compliance.

Wednesday, October 23, 2013

PHOENIX

EPH Fractionation Standard

SDG I.D.: GBF52851

Effective Date(s): 01/09/13 - 01/09/14 **Analyst:**

AS #	TV	#1	#2	#3	#4	Avg	% Rec	% RSD	Rec Limits	RSD Limits
Naphthalene	10	6.79	7.06	7.12	6.83	6.95	69.5	2.4	40-140	20
2-Methylnaphthalene	10	6.68	7.12	7.27	6.96	7.01	70.1	3.6	40-140	20
Acenaphthalene	10	7.17	7.70	8.16	7.41	7.61	76.1	5.6	40-140	20
Acenaphthene	10	8.02	8.43	8.81	8.14	8.35	83.5	4.2	40-140	20
Fluorene	10	7.96	8.64	8.78	8.23	8.40	84.0	4.5	40-140	20
Phenanthrene	10	8.85	9.37	9.59	9.02	9.21	92.1	3.6	40-140	20
Anthracene	10	14.10	15.20	15.40	14.50	14.80	148.0	4.1	40-140	20
Fluoranthene	10	10.10	10.20	10.40	10.20	10.23	102.3	1.2	40-140	20
Pyrene	10	9.60	10.10	10.50	10.00	10.05	100.5	3.7	40-140	20
Benzo(a)anthracene	10	10.10	10.40	10.60	10.40	10.38	103.8	2.0	40-140	20
Chrysene	10	9.88	10.10	10.60	10.20	10.20	102.0	3.0	40-140	20
Benzo(b)fluoranthene	10	9.95	9.66	11.40	10.60	10.40	104.0	7.4	40-140	20
Benzo(k)fluoranthene	10	9.57	10.00	9.35	9.23	9.54	95.4	3.6	40-140	20
Benzo(a)pyrene	10	9.07	9.15	9.78	9.27	9.32	93.2	3.4	40-140	20
Indeno(123cd)pyrene	10	9.10	9.54	10.00	9.88	9.63	96.3	4.2	40-140	20
Dibenz(ah)anthracene	10	9.80	9.70	10.30	9.54	9.84	98.4	3.3	40-140	20
Benzo(ghi)perylene	10	9.60	9.70	10.20	9.75	9.81	98.1	2.7	40-140	20
Nonane c9	10	3.68	3.80	3.91	3.61	3.75	37.5	3.5	25-140	20
Decane c10	10	5.16	5.46	6.04	5.15	5.45	54.5	7.7	40-140	20
Dodecane c12	10	6.12	6.50	6.31	6.25	6.30	63.0	2.5	40-140	20
Tetradecane c14	10	7.48	7.92	8.40	7.76	7.89	78.9	4.9	40-140	20
Hexadecane c16	10	8.69	9.23	9.86	9.10	9.22	92.2	5.3	40-140	20
Octadecane c18	10	9.92	10.70	11.10	10.80	10.63	106.3	4.7	40-140	20
Eicosane c20	10	10.00	10.90	11.20	10.80	10.73	107.3	4.8	40-140	20
Henecosane c21	10	9.82	10.90	11.20	10.70	10.66	106.6	0.6	40-140	20
Docosane c22	10	10.10	11.20	11.50	10.90	10.93	109.3	5.5	40-140	20
Tetracosane c24	10	10.10	11.30	11.50	10.90	10.95	109.5	5.7	40-140	20
Hexacosane c26	10	9.92	11.10	11.40	10.70	10.78	107.8	6.0	40-140	20
Octacosane c28	10	9.46	10.70	11.00	10.30	10.37	103.7	6.4	40-140	20
Tricotane c30	10	9.24	10.60	10.80	10.20	10.21	102.1	6.8	40-140	20
Dotriacontane c32	10	8.68	9.88	10.20	9.51	9.57	95.7	0.7	40-140	20

Wednesday, October 23, 2013

PHOENIX

EPH Fractionation Standard

SDG I.D.: GBF52851

Effective Date(s): 01/09/13 - 01/09/14 **Analyst:**

AS #	TV	#1	#2	#3	#4	Avg	% Rec	% RSD	Rec Limits	RSD Limits
Tetratriacontane c34	10	8.44	9.84	10.10	9.65	9.51	95.1	0.7	40-140	20
Hexatriacontane c36	10	7.70	8.96	9.35	8.80	8.70	87.0	8.1	40-140	20
Octatriacontane c38	10	6.56	7.98	8.20	7.97	7.68	76.8	0.8	40-140	20
Tetracontane c40	10	6.52	7.39	7.63	7.60	7.29	72.9	0.5	40-140	20
c9-c12 Aliphatic	30	14.90	15.70	10.00	14.90	13.88	46.3	2.6	25-140	20
c12-c16 Aliphatic	20	16.10	17.10	18.20	16.80	17.05	85.3	0.9	40-140	20
c16-c21 Aliphatic	30	29.80	32.40	33.50	32.40	32.03	106.8	1.6	40-140	20
c21-c40 Aliphatic	100	88.40	101.00	103.00	97.90	97.58	97.6	6.5	40-140	20

Cooler: Yes ☐ No ☐
Coolant: IPK ☐ ICE ☐ No ☐

Temp °C Pg of

CHAIN OF CUSTODY RECORD

PHOENIX Environmental Laboratories, Inc.

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Contact Options:
☐ Fax:
☐ Phone:
☐ Email:

Customer: Solidification Products
Address: 215 Village Street
Stamford, CT 06472

Project: Treated Production For ME-DEP
Report to: William Gannon
Invoice to: William Gannon

Project P.O:

This section MUST be completed with Bottle Quantities.

Sampler's Signature: [signature] Date: 10/11/13

Client Sample - Information - Identification

Matrix Code:
DW=Drinking Water **GW**=Ground Water **SW**=Surface Water **WW**=Waste Water
RW=Raw Water **SE**=Sediment **SL**=Sludge **S**=Soil **SD**=Solid **W**=Wipe
OIL=Oil **B**=Bulk **L**=Liquid

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	EPH with Targets	PCBs									Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container (32) oz	GL Soil container ( ) oz	40 ml VOA Vial [ ] As is [ ] HCl	GL Amber 1000ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria Bottle
	Transformer oil/water	WW	10/11/13	11:00	X					52851						2									
	Diesel Fuel/water				X					52852						2									
	Transformer oil/water Treated				X					52853						2									
	Transformer oil/water Treated Dup.				X					52854						2									
	Diesel Fuel/water Treated				X					52855						2									
	Diesel Fuel/water Treated Dup				X					52856						2									
	PCB Water Treated				X	X				52857						1									
	PCB Water Treated Dup				X	X				52858						1									
	PCB Water Treated Triplicate				X	X				52859						1									

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	10/11/13	1300

Comments, Special Requirements or Regulations:

Turnaround:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☑ Standard
☐ Other
* SURCHARGE APPLIES

RI
☐ Direct Exposure (Residential)
☐ GW
☐ Other

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1
☐ S-2
☐ S-3
☐ MWRA eSMART
☐ Other

State where samples were collected: _____

Data Format
☐ Excel
☐ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☐ Phoenix Std Report
☐ Other

* SURCHARGE APPLIES

ERA

A Waters Company

GBF52851

DataPacK™

Lot No. 06046
Aroclor 1248 Low level

PCBs in Oil

Catalog No. 826

Certification

Parameter	Certified Value	Performance Acceptance Limits™
	mg/Kg	mg/Kg
Aroclor 1016	< 10	-
Aroclor 1221	< 10	-
Aroclor 1232	< 10	-
Aroclor 1242	< 10	-
Aroclor 1248	35.6	11.5 - 47.0
Aroclor 1254	< 10	-
Aroclor 1260	< 10	-

Analytical Verification

Parameter	Certified Value	Mean Recovery		n	NIST SRM Number
	mg/Kg	mg/Kg	%		
Aroclor 1016	< 10	-	-	-	NIST SRM 3075
Aroclor 1221	< 10	-	-	-	NIST SRM not available
Aroclor 1232	< 10	-	-	-	NIST SRM 3076
Aroclor 1242	< 10	-	-	-	NIST SRM 3077
Aroclor 1248	35.6	34.1	95.7%	3	NIST SRM 3078
Aroclor 1254	< 10	-	-	-	NIST SRM 3079
Aroclor 1260	< 10	-	-	-	NIST SRM 3080

The **Certified Values** are the actual 'made-to' concentrations confirmed by ERA analytical verification.

The **Performance Acceptance Limits (PALs™)** are based on actual historical data collected in ERA's Proficiency Testing program. The **PALs™** reflect any inherent biases in the methods used to establish the limits and closely approximate a 95% confidence interval of the performance that experienced laboratories should achieve using accepted environmental methods. Use these **PALs™** to realistically evaluate your performance against your peers.

The **Analytical Verification** data was generated by ERA, solely. In addition, where NIST Standard Reference Materials (SRMs) are available, each analyte has been analytically traced to the NIST SRM listed.

Please call ERA at 1-800-372-0122 if you have any questions or need technical assistance.

APPENDIX F-
Noise Studies

ANALYSIS OF ACOUSTICAL IMPACT

ORANGE AND ROCKLAND UTILITIES
PROPOSED LITTLE TOR SUBSTATION
South Mountain Road and N. Little Tor Road
New City, New York

OSTERGAARD ACOUSTICAL ASSOCIATES

Prepared For: **Orange and Rockland Utilities**
Prepared by: **Benjamin C. Mueller, P.E.**
Reviewed by: **John Erdreich, Ph.D.**
OAA File: **3559A**
Date: **1 February 2010**

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I. INTRODUCTION

Ostergaard Acoustical Associates has analyzed the proposed Orange and Rockland Utilities Substation (Little Tor) in New City, New York to determine the acoustical impact, if any, on the surrounding community. The substation will contain three new transformers and two new gas regulator stations. These transformers are cooled by natural convection at times, supplemented with fans.

To determine the acoustical impact of the proposed substation on surrounding areas it is necessary to compare the existing ambient sound with the projected sound contributed by the substation. A survey of the ambient sound was conducted that included both long-term 48-hour A-weighted sound level monitoring at four locations, as well as short-term octave band sound pressure level measurements during both the daytime and nighttime. The site sound emissions were calculated using a computer model of the installation and compared with the ambient survey data.

II. SITE DESCRIPTION

The proposed substation is on the southwest corner of the intersection of South Mountain Road and North Little Tor Road, CR-33. The site is shown in Figure 1, which is based on aerial images provided by Google Earth®. The four ambient survey locations are also shown. Residences border the site to the west and the Hackensack River borders the south. Other residences are located further from the site buffered by roads or the river. Currently on site are a gas regulator station to the northwest and a Verizon communication shelter to the west. There is a major elevation change in the northeast portion of the site due to a large rock formation.

The substation will include a switchgear house and three transformers: two Enerco 50 MVA units and one Magnatek 25 MVA unit. Two new gas regulator stations are proposed north of the substation.

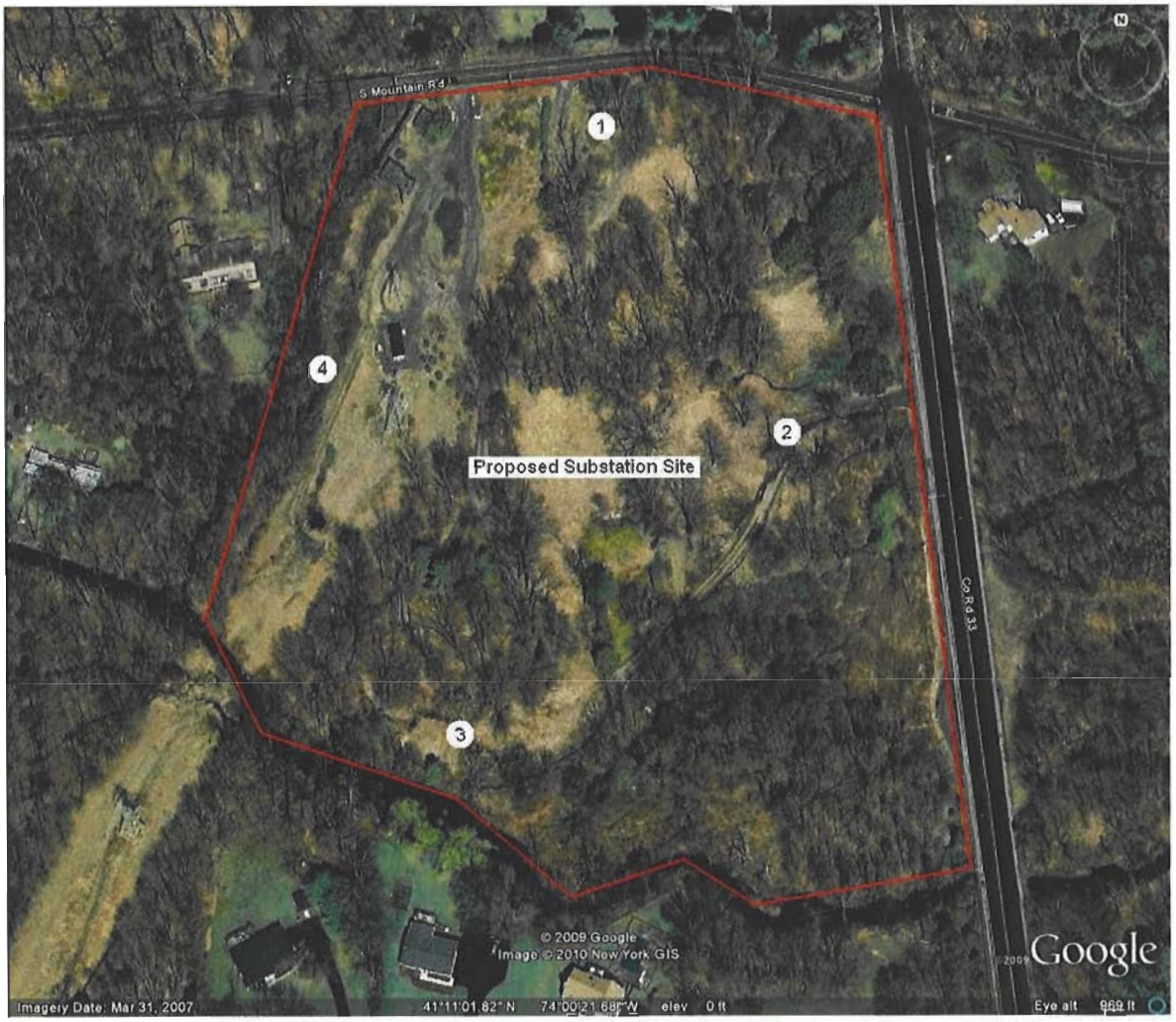

Figure 1 — Proposed site for Little Tor Substation and vicinity. Survey Locations 1 through 4 are also shown.

III. CRITERIA

The local noise code of Clarkstown, New York is discussed under Chapter 205 Noise and Chapter 290-13 Performance Standards. Chapter 205 is a nuisance noise ordinance and does not contain quantitative noise limits. For a residential district, Chapter 290-13 specifies a maximum nighttime noise limit of 46 dB(A) from 2200 hours to 0700 hours measured 25 feet from the principal building. Because there is no principal building on site, this criterion was applied at the substation property line. This limit is reduced to 41 dB(A) for noises of periodic character such as a hum. There are also limits in octave bands.

Article IX of the Rockland County Sanitary Code also discusses maximum noise limits in section 9.8.2 which limits noise produced at a residential property line to a maximum sound pressure level of 65 dB(A), or L_{10} of 60 dB(A), during the day from 0700 hours to 2200 hours. This limit is reduced to a maximum sound pressure level of 55 dB(A), or L_{10} of 50 dB(A), at night from 2200 hours to 0700 hours.

The State of New York has not implemented a state-wide noise code.

IV. AMBIENT SOUND LEVELS

To analyze environmental acoustical data it is convenient to treat the sound levels statistically. This is because sound levels can vary over a considerable range because many sources contribute to outdoor sound measured at a location. Transient ambient sources often raise sound levels 20 decibels or more above background sound levels. The following descriptors are most often used to assess data of this type:

> L_{90} - The sound level exceeded 90 percent of the time during a given measurement period. L_{90} is usually referred to as the background sound level.
>
> L_{50} - This is the median level exceeded 50 percent of the time during a measurement period.

L_{10} - This is the sound level exceeded 10 percent of the time during a measurement period. L_{10} is a measure of the contribution of intrusive sound sources.

L_{eq} - The equivalent continuous noise level that would exist if all the noise in the measurement period were averaged over that time period.

L_{min} (L_{max}) - The minimum (maximum) (slow or fast averaged) noise level during the measuring period.

V. SURVEY MONITORS

On 8 January 2010, Mr. Benjamin Mueller visited the site to place the four automated sound level monitors. Data recorded included 24-hours on the weekend, Sunday 10 January, and 24-hours on a weekday, Monday 11 January. Daytime weather conditions in the area for 10 January were clear skies, a temperature of 26°F, with winds of 11mph. On 11 January the weather conditions were similar with clear skies, a temperature of 24°F, and steady winds of 8 mph.

Monitor locations are shown in Figure 1 and were selected to typify the following locations:

1: Near north side of site, 50 feet south of South Mountain Road.

2: East side of site, 140 feet west of CR-33.

3: South portion of site, set back from the Hackensack River.

4: West side of site, 50 feet east of nearest residential property line.

The monitors, Larson Davis type 720 and 820 units, were programmed to measure sound eight times per second and to store the average result each minute. Time history graphs of the Sunday and Monday results are shown in Figures 2 through 9. The monitors were also

programmed to store statistical sound levels for each hour based on the sampling of eight times per second. The statistical distribution for each location is shown in Figures 10 through 17. Additional information about the survey monitors can be found in the Appendix A.

VI. GENERAL SURVEY RESULTS

Time histories in Figures 2 through 9 show the one-minute average noise levels measured at each location. Location 1 averages approximately 50 dB(A) during the day and the mid 40's at night. Location 1 is most influenced by the existing gas regulator station on site. Traffic from South Mountain Road affects the ambient sound level throughout the day at this location. Influences from the higher speed traffic on CR-33 affect measured levels at Location 2 where measured daytime levels were in the upper 50's while nighttime levels dropped to the mid 30's at times in between infrequent traffic passbys. Location 3 measured steady noise levels due to the proximity to the steady water flowing in the Hackensack River and the greater distance from local traffic. Average levels remained in the mid 40's during the day and night. Location 4 was also more remote from local traffic and measured daytime levels in the mid 40's while at nighttime, levels decreased to the low 40's.

Figures 10 through 17 provide data in a statistical format, and give the maximum and minimum sound levels over each hour in addition to the average sound levels. In general, there was little difference in the ambient between a weekend day and weekday.

Project: Little Tor Substation
Project Number: 3599A

Measured Sound Levels at Location 1
Sunday, 10 January 2010

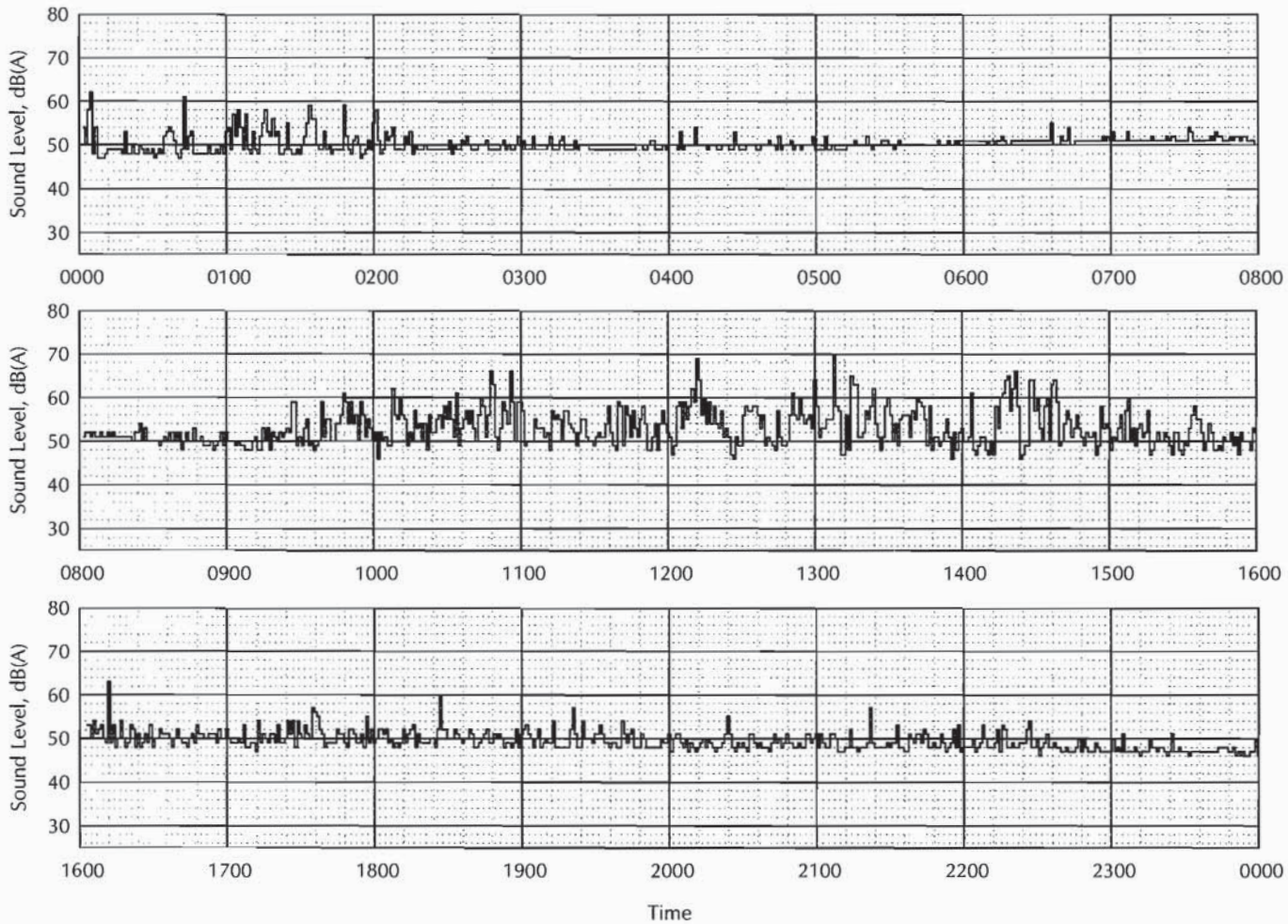

Figure 2

Project: Little Tor Substation
Project Number: 3599A

Measured Sound Levels at Location 1
Monday, 11 January 2010

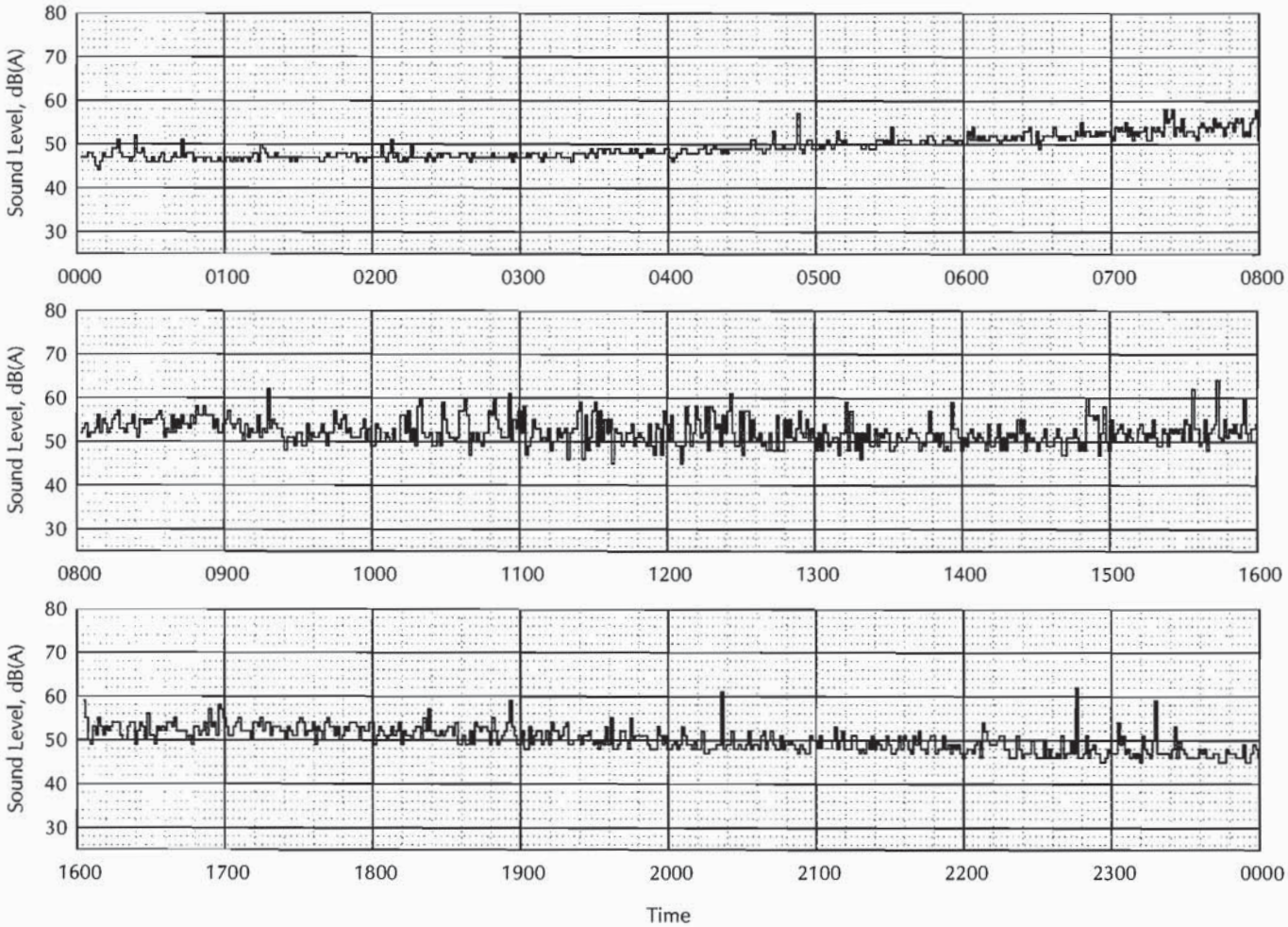

Figure 3

Project: Little Tor Substation
Project Number: 3599A

Measured Sound Levels at Location 2
Sunday, 10 January 2010

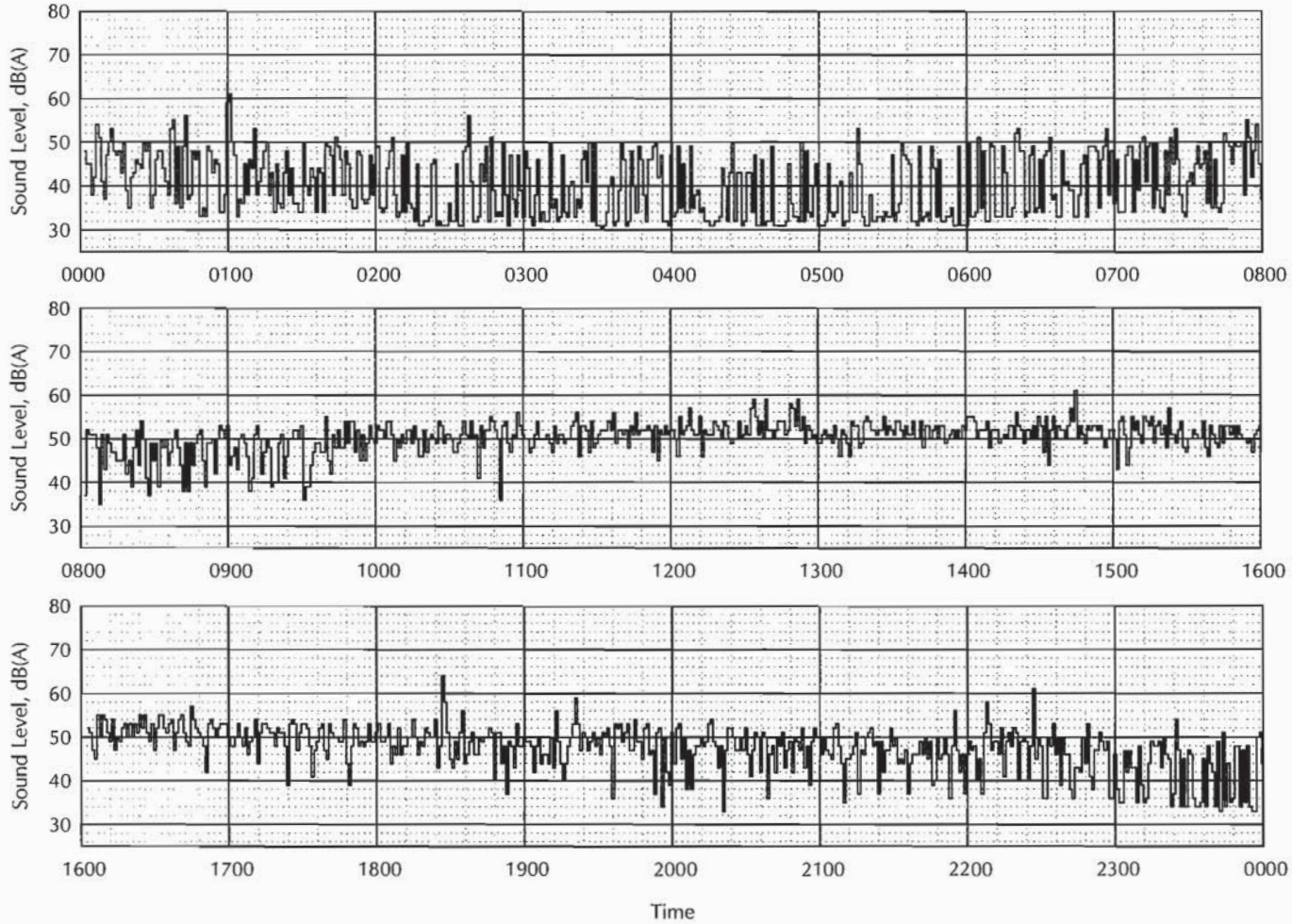

Figure 4

Project: Little Tor Substation
Project Number: 3599A

Measured Sound Levels at Location 2
Monday, 11 January 2010

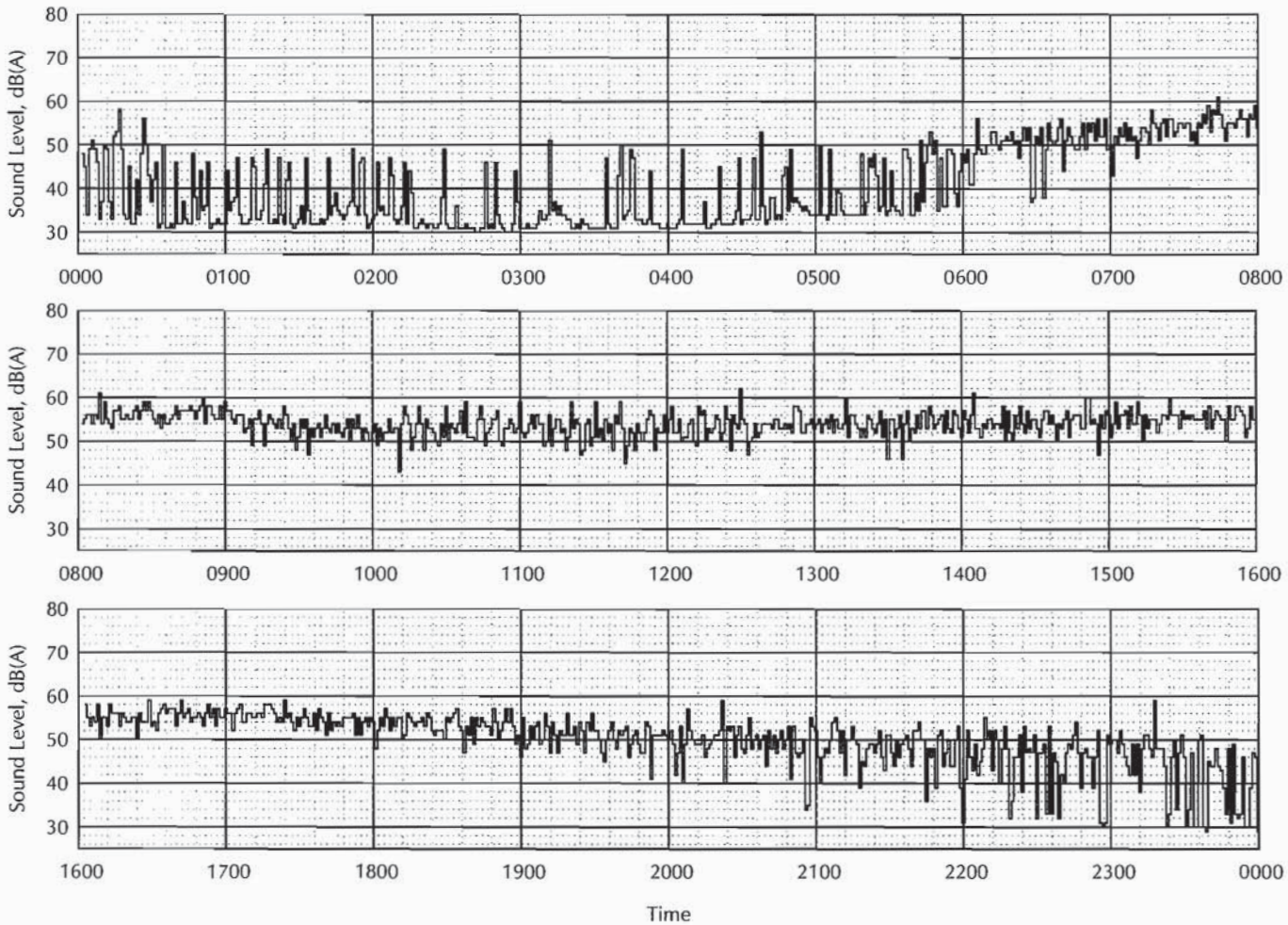

Figure 5

Project: Little Tor Substation
Project Number: 3599A

Measured Sound Levels at Location 3
Sunday, 10 January 2010

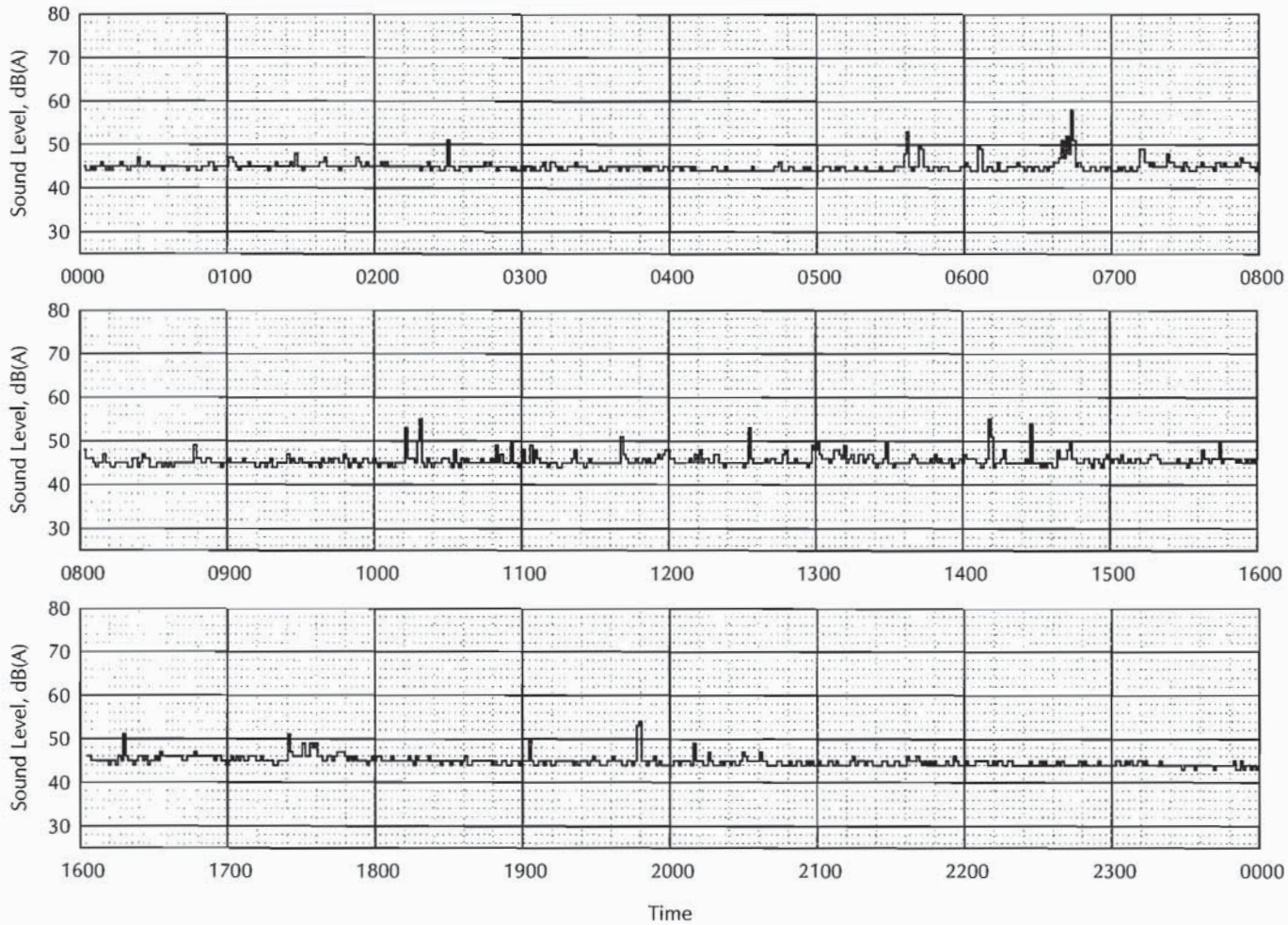

Figure 6

Project: Little Tor Substation
Project Number: 3599A

Measured Sound Levels at Location 3
Monday, 11 January 2010

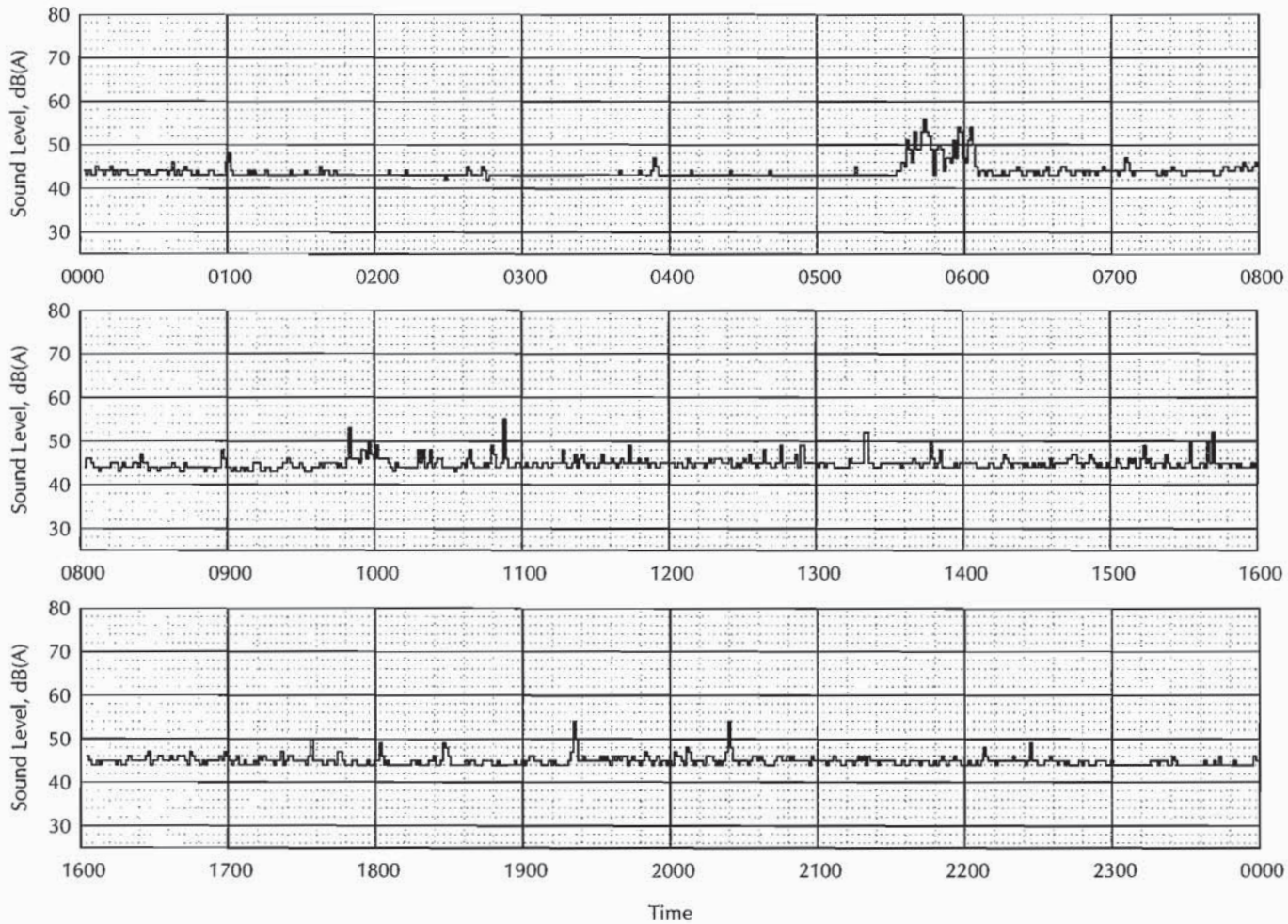

Figure 7

Project: Little Tor Substation
Project Number: 3599A

Measured Sound Levels at Location 4
Sunday, 10 January 2010

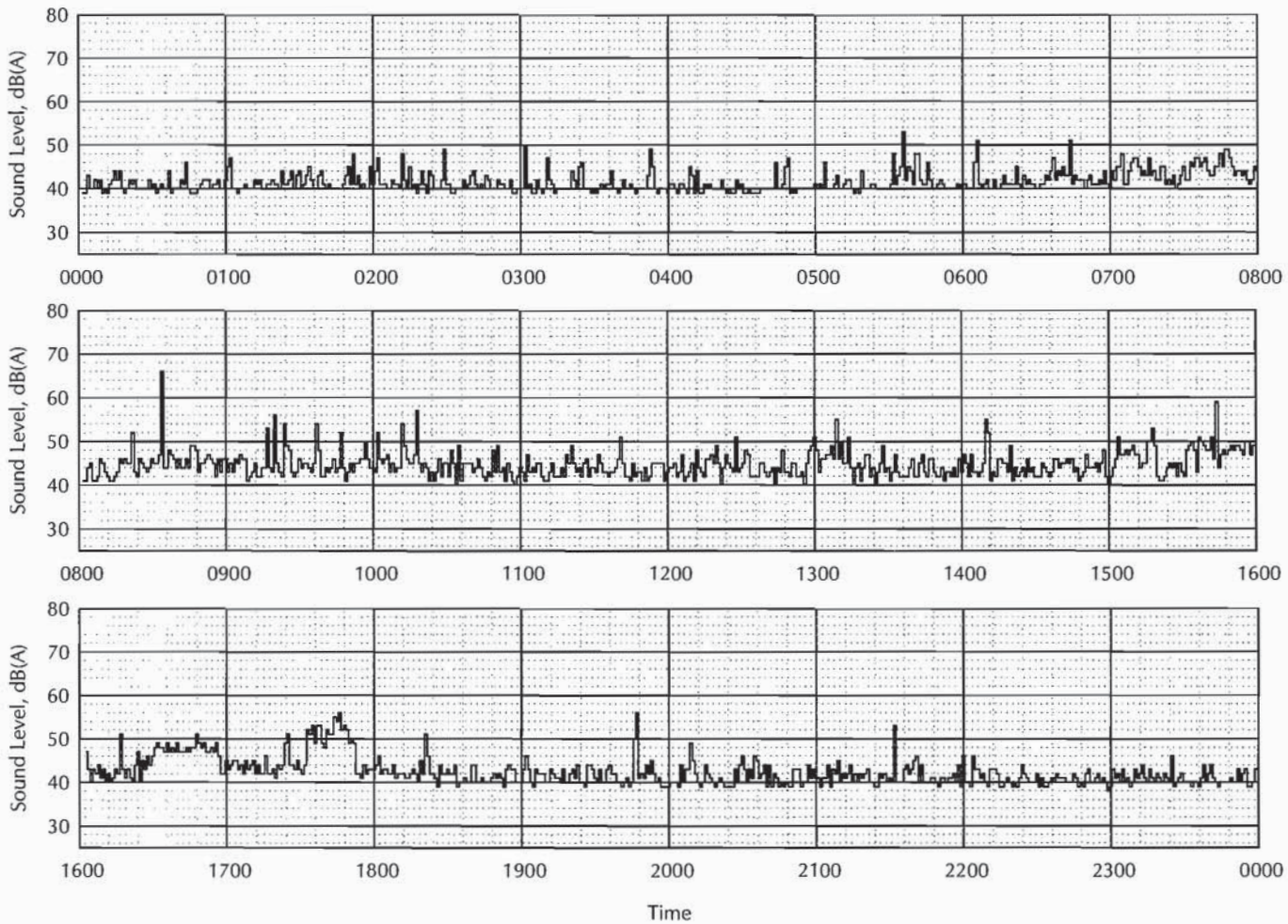

Figure 8

Project: Little Tor Substation
Project Number: 3599A

Measured Sound Levels at Location 4

Monday, 11 January 2010

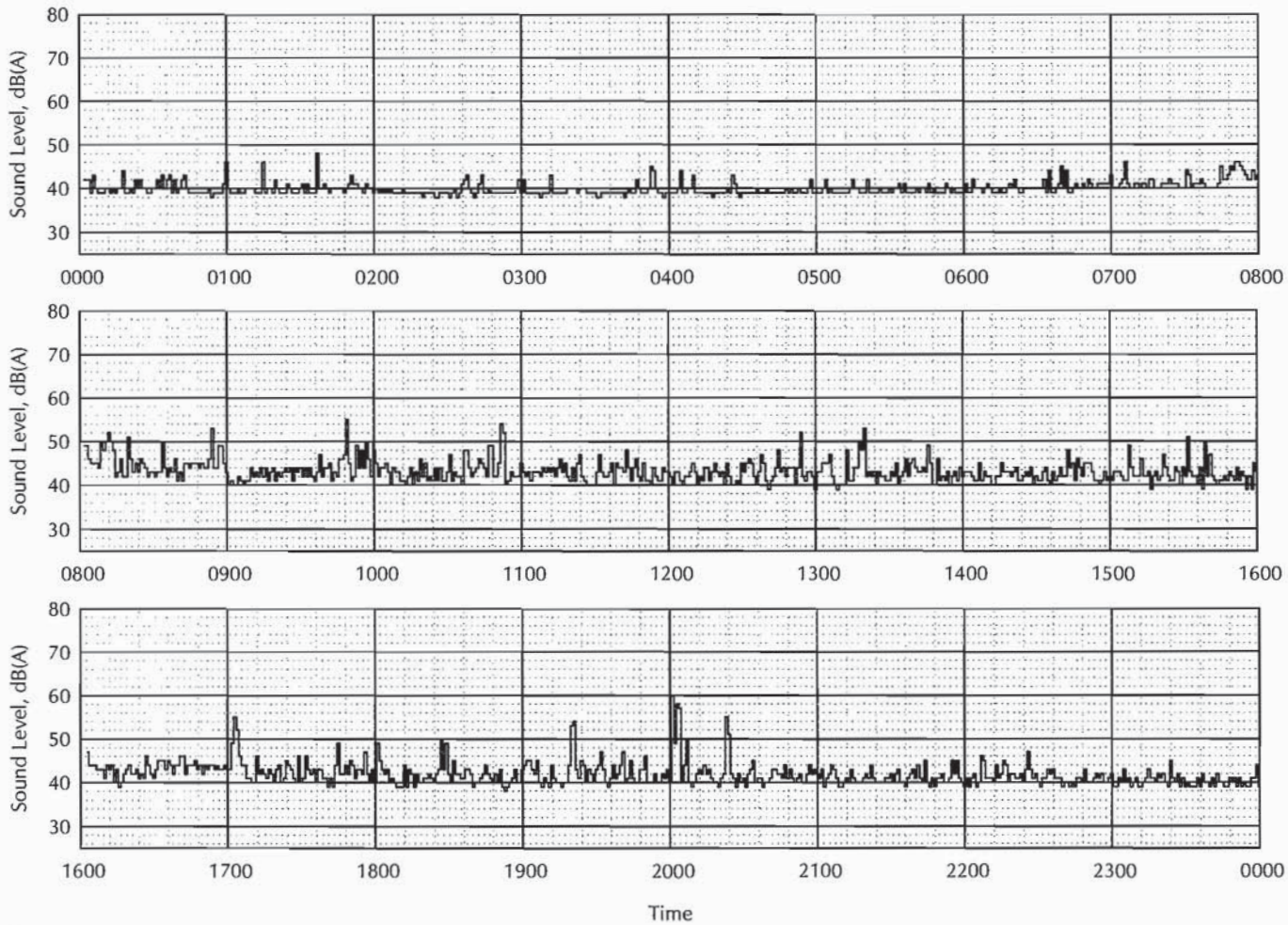

Figure 9

Project: Little Tor Substation
Project Number: 3559A

Statistical Distribution of Sound Levels at Location 1
Sunday, 10 January 2010

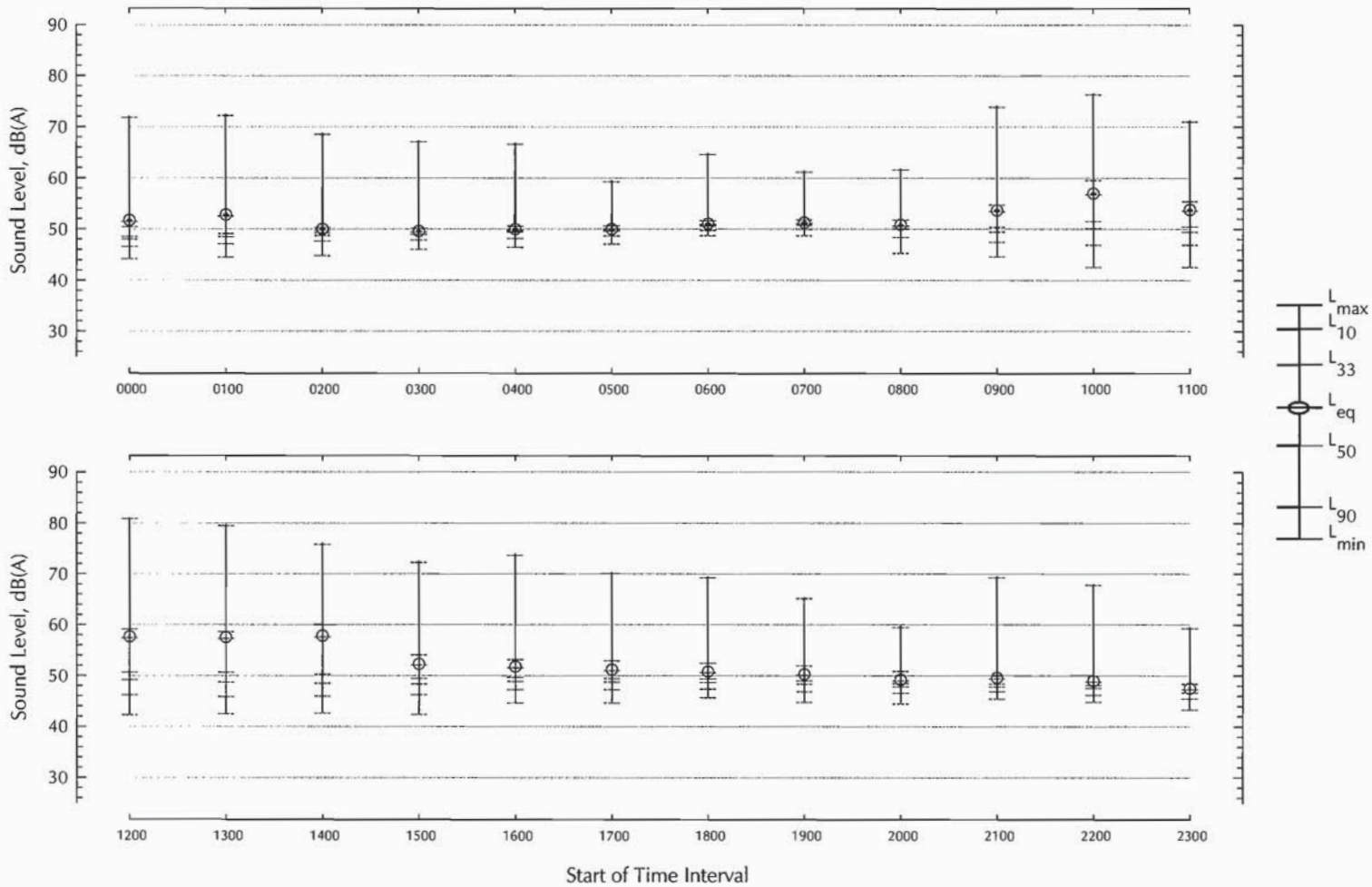

Figure 10

Project: Little Tor Substation
Project Number: 3559A

Statistical Distribution of Sound Levels at Location 1
Monday, 11 January 2010

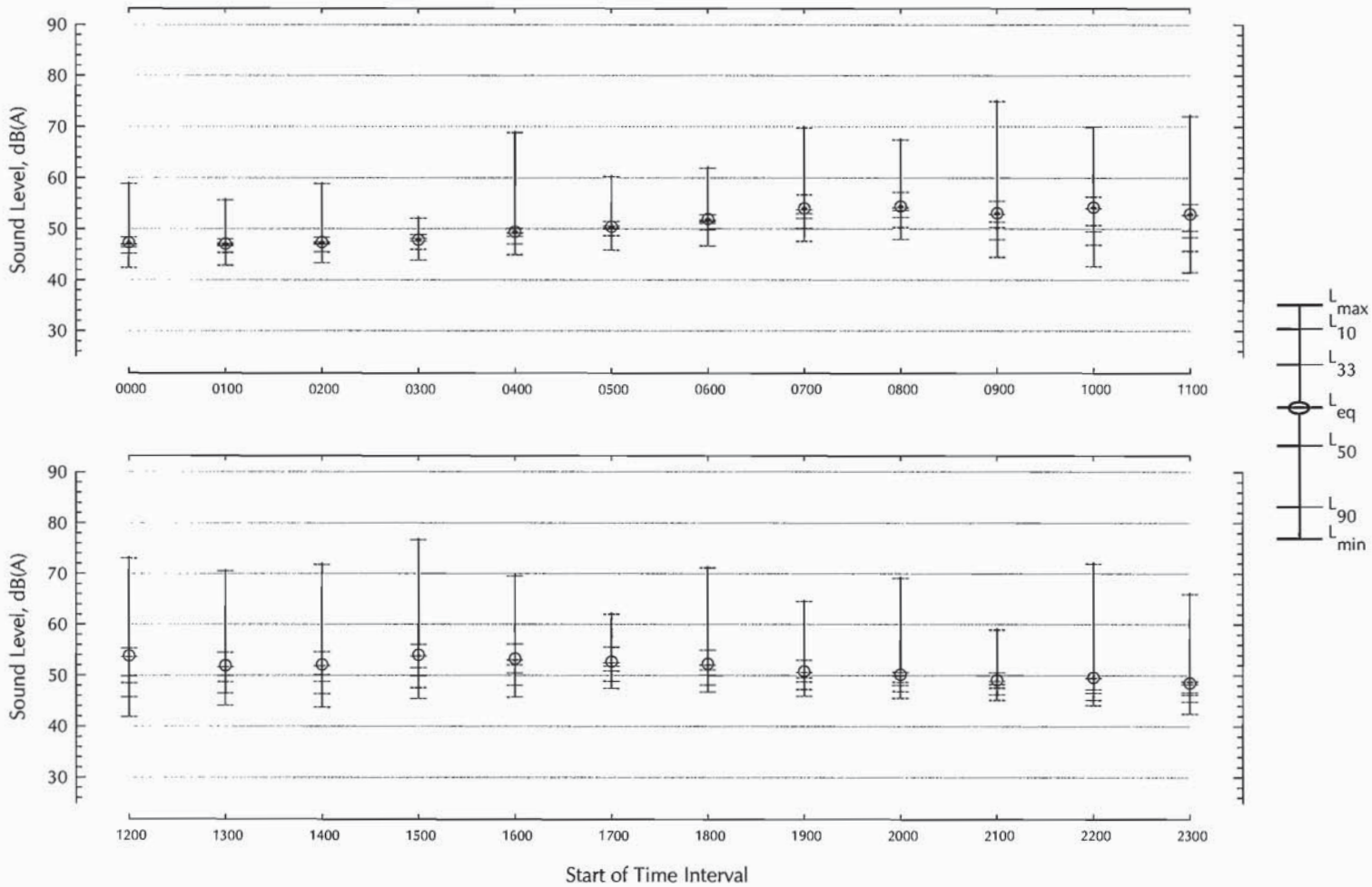

Figure 11

Project: Little Tor Substation
Project Number: 3559A

Statistical Distribution of Sound Levels at Location 2
Sunday, 10 January 2010

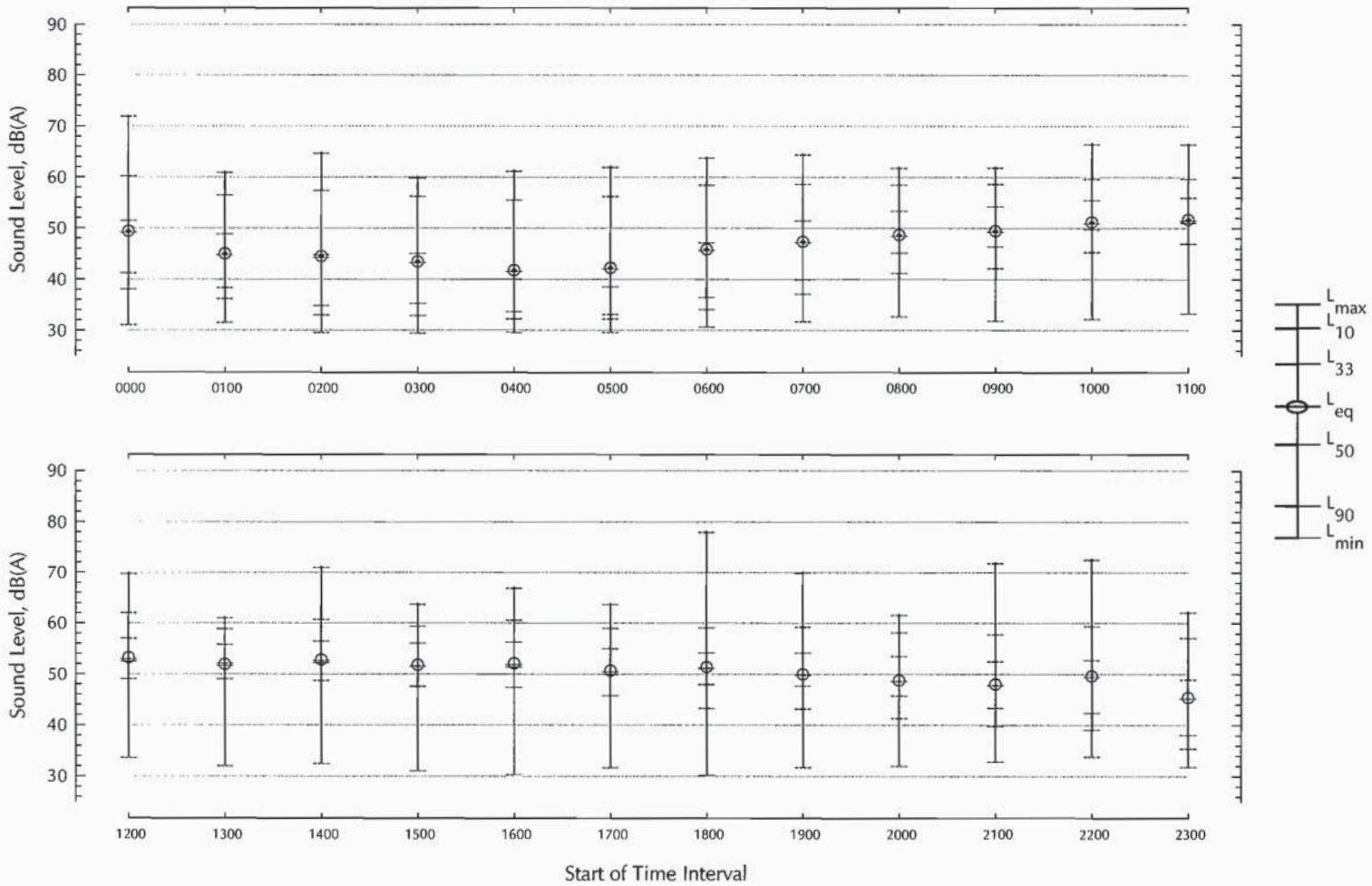

Figure 12

Project: Little Tor Substation
Project Number: 3559A

Statistical Distribution of Sound Levels at Location 2
Monday, 11 January 2010

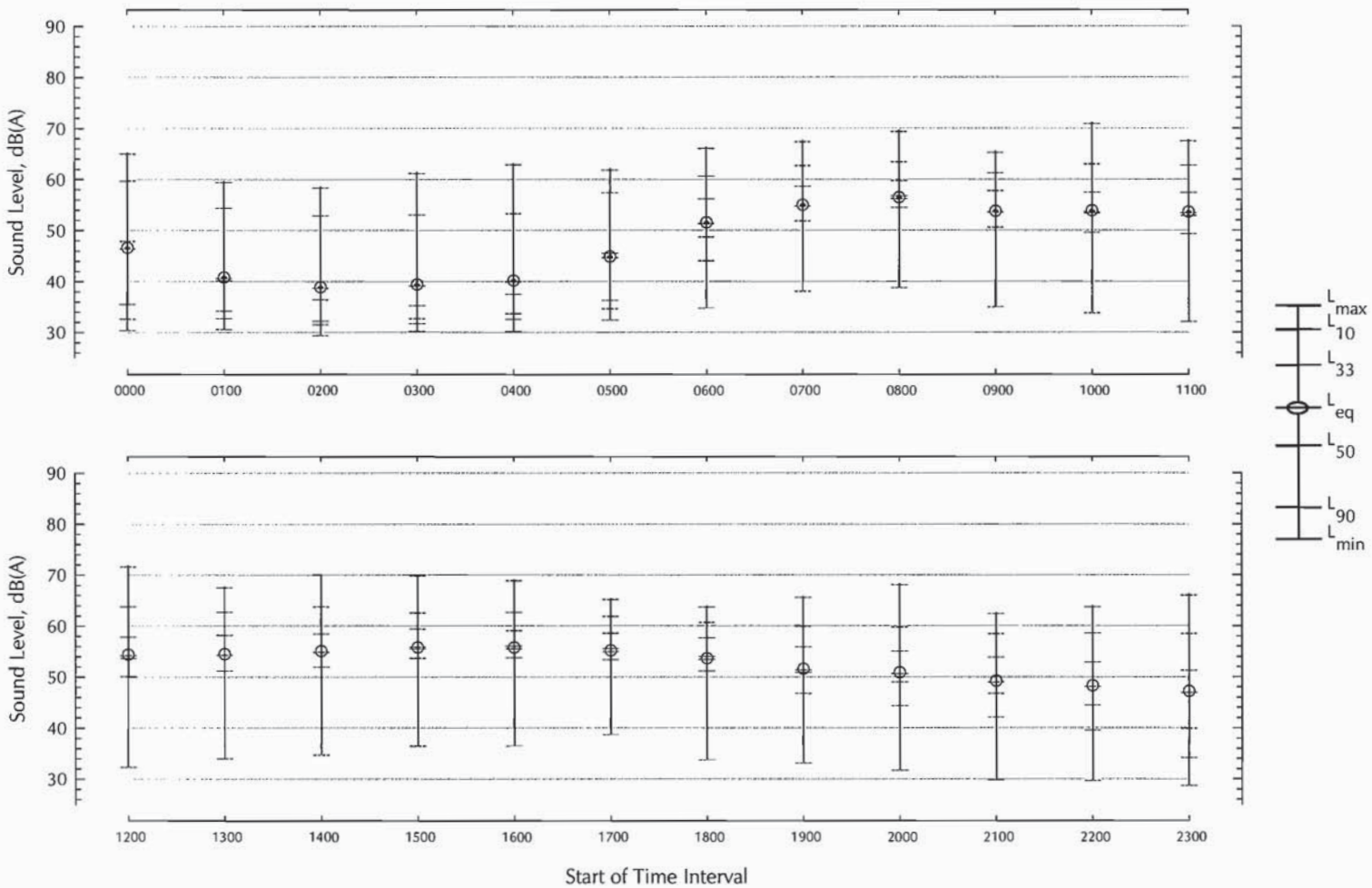

Figure 13

Project: Little Tor Substation
Project Number: 3559A

Statistical Distribution of Sound Levels at Location 3
Sunday, 10 January 2010

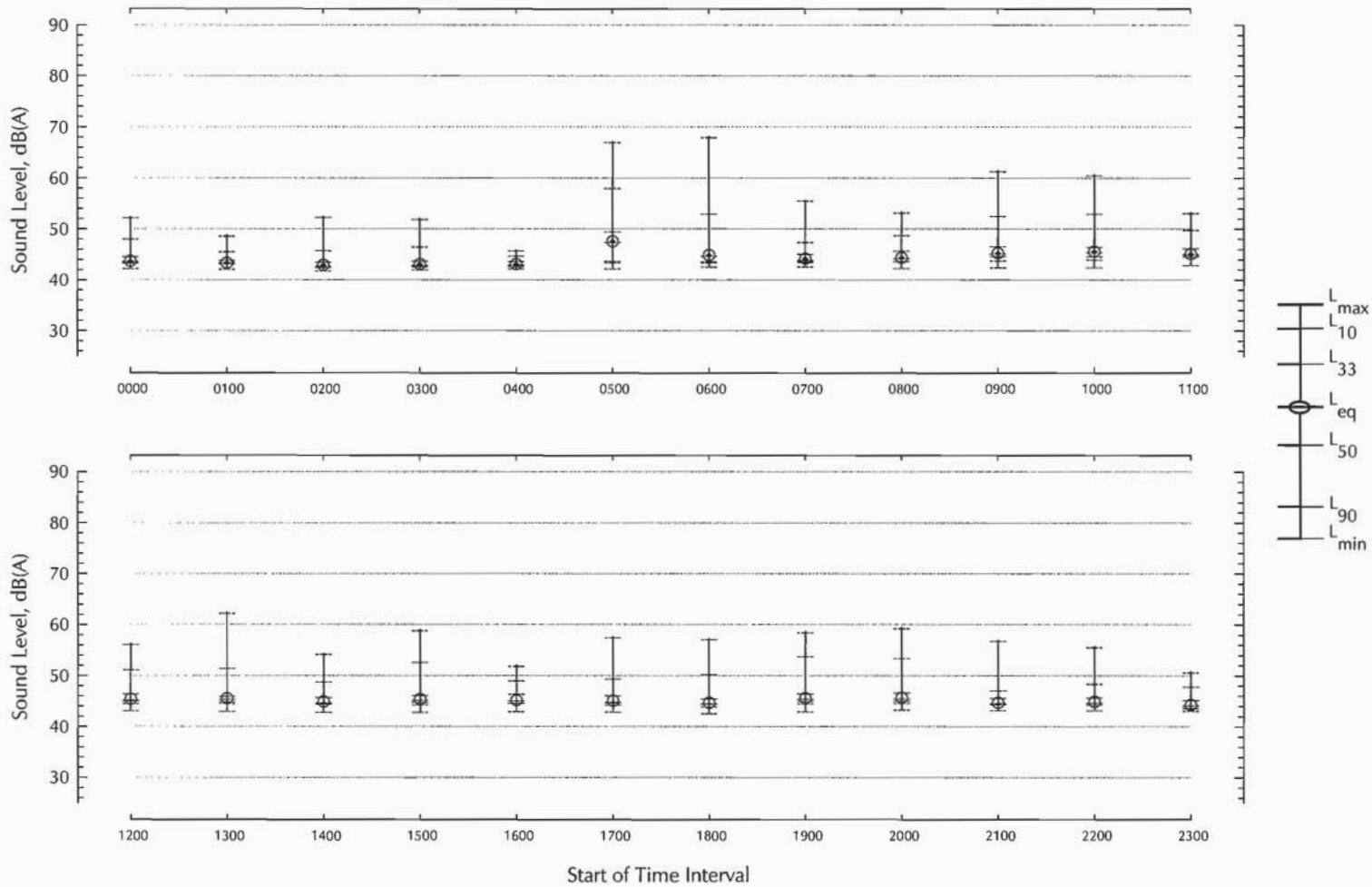

Figure 14

Project: Little Tor Substation
Project Number: 3559A

Statistical Distribution of Sound Levels at Location 3
Monday, 11 January 2010

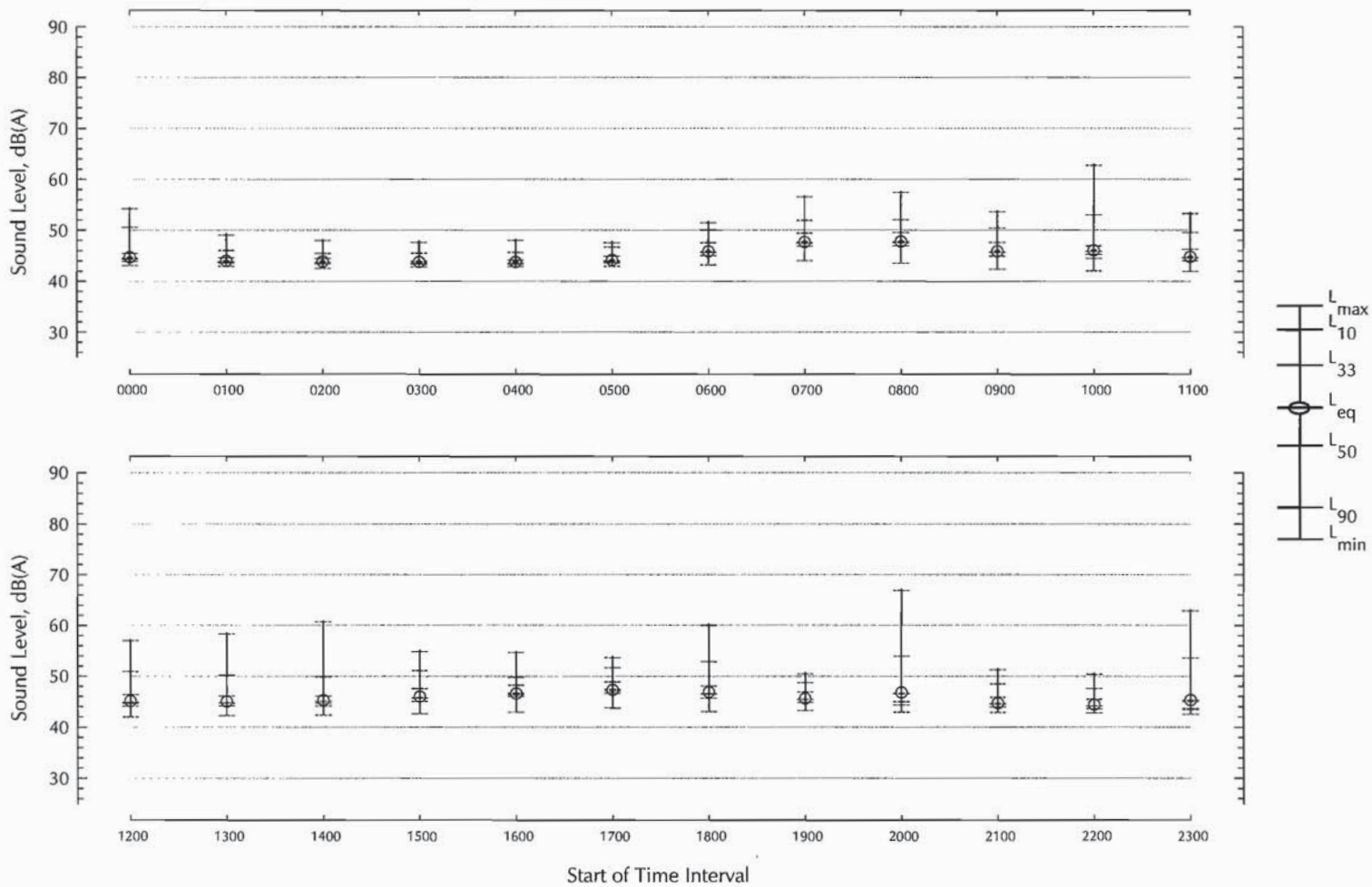

Figure 15

Project: Little Tor Substation
Project Number: 3559A

Statistical Distribution of Sound Levels at Location 4
Sunday, 10 January 2010

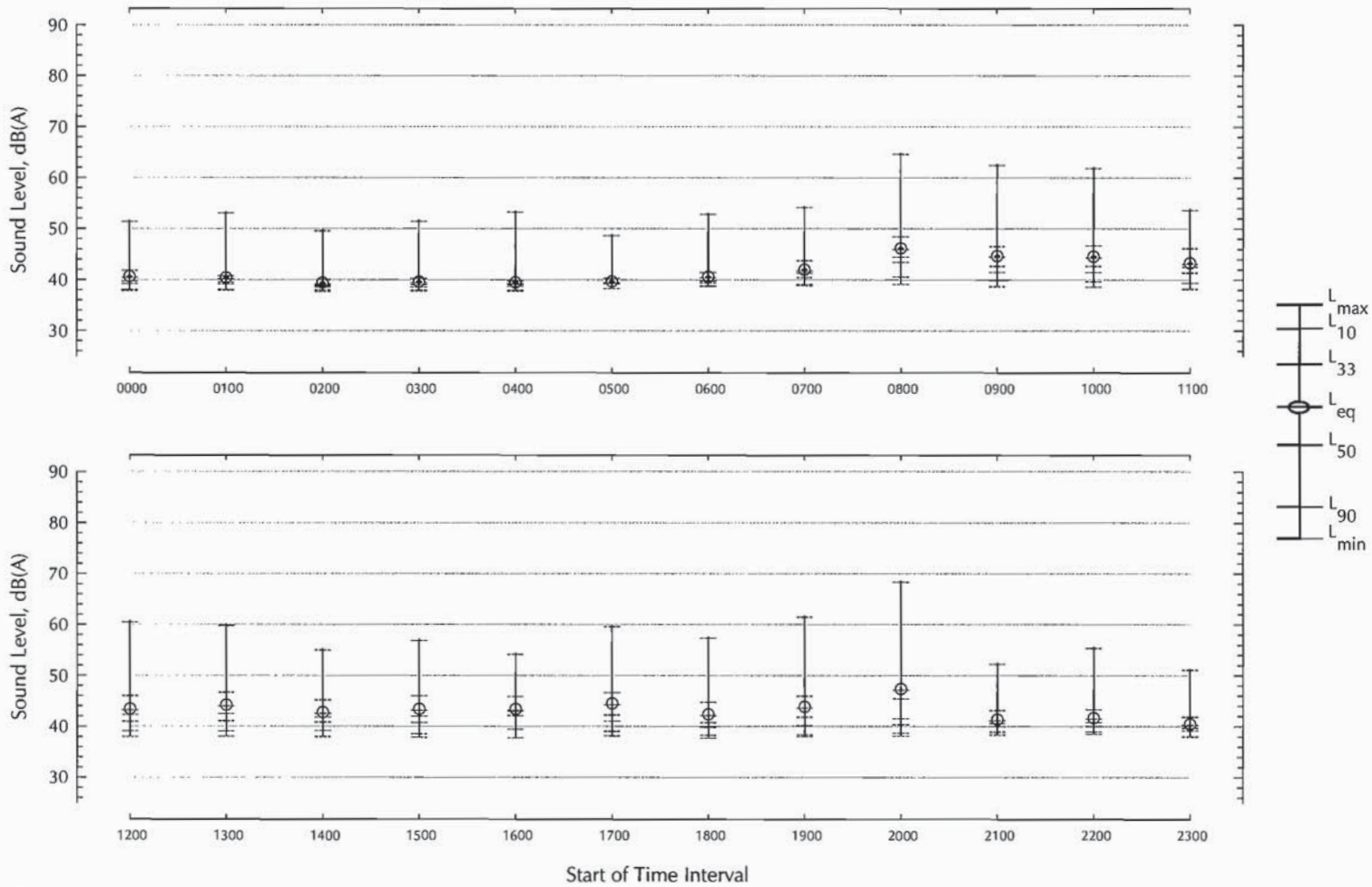

Figure 16

Project: Little Tor Substation
Project Number: 3559A

Statistical Distribution of Sound Levels at Location 4
Monday, 11 January 2010

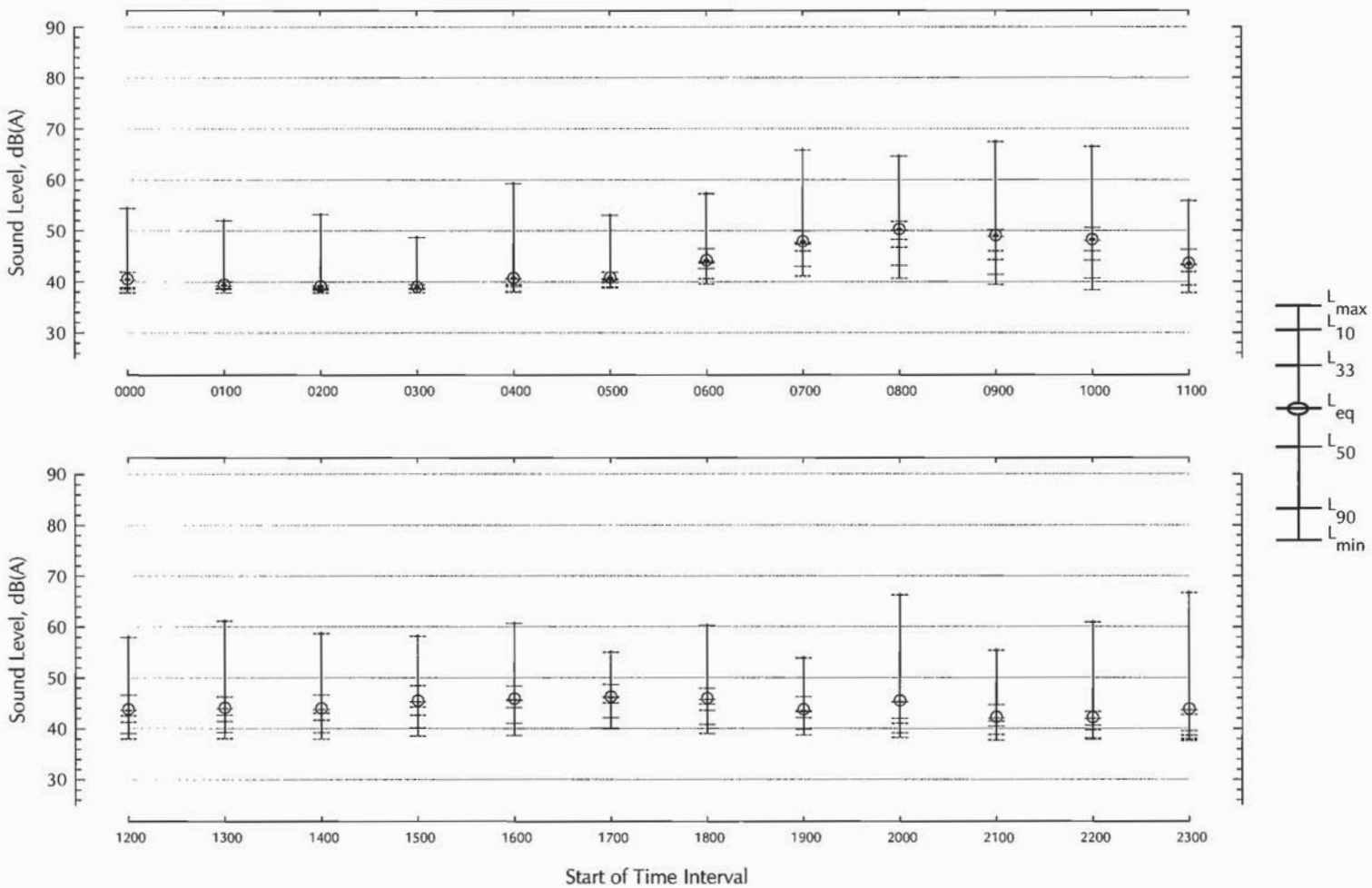

Figure 17

VII. OCTAVE BAND SOUND PRESSURE LEVEL MEASUREMENTS

Octave band sound pressure levels were measured during the daytime and nighttime on site. Daytime data were obtained on 13 January from 1130 to 1230 hours and nighttime data were obtained on 14 January from 2215 to 2315 hours. The data were obtained using a Bruel & Kjaer Model 2250 real-time sound analyzer. Information on the measurement equipment can be found in the Appendix A. Data were stored for later analysis in the laboratory. Ten-minute duration samples taken at each of the four locations are shown in Table I.

Table I — Measured day and night background (L_{90}) and intrusive (L_{10}) sound pressure levels at Locations 1 through 4, in dB re 20 μPa.

	Octave Band Center Frequency (Hz)							
	63	**125**	**250**	**500**	**1000**	**2000**	**4000**	**A***
Location 1								
Daytime L_{10}	59	54	50	49	48	45	37	53
Daytime L_{90}	51	44	36	37	37	37	32	44
Nighttime L_{10}	53	50	39	41	42	38	32	46
Nighttime L_{90}	47	43	36	37	35	34	29	41
Location 2								
Daytime L_{10}	62	63	52	50	55	51	45	58
Daytime L_{90}	50	45	35	37	38	33	25	43
Nighttime L_{10}	55	51	43	45	51	46	36	53
Nighttime L_{90}	48	43	34	36	32	24	18	37

Table I (continued)

Location 3								
Daytime L_{10}	56	54	50	42	42	38	33	47
Daytime L_{90}	48	41	34	35	36	33	28	40
Nighttime L_{10}	55	50	41	41	41	37	32	46
Nighttime L_{90}	48	43	37	38	38	35	30	42
Location 4								
Daytime L10	61	55	44	44	44	40	42	49
Daytime L90	49	42	34	35	34	35	33	42
Nighttime L10	52	48	40	41	41	38	32	45
Nighttime L90	48	44	36	37	35	34	29	41

* A denotes the A-weighted sound level

Daytime L_{10} sound pressure levels ranged from 47-to-58 dB(A) while L_{90} sound levels ranged from 40-to-44 dB(A). Similarly, nighttime L_{10} data ranged from 43-to-46 dB(A) and L_{90} data ranged from 37-to-42 dB(A). The daytime and nighttime L90 levels for Locations 3 and 4 were very similar because they are more remote from local traffic.

VIII. SITE MODELING

A computer model of the site and surrounding terrain was constructed based on CAD site plans provided by Orange and Rockland Utilities, equipment dimensions, manufacturer's sound data, and site measurements. Terrain contours were imported from the CAD files provided.

The acoustical model provides A-weighted sound pressure level contours for site noise sources. The contours are at 5 feet above grade. The model takes into account shielding and reflections provided by the transformers themselves, as well as other onsite structures such as the Verizon communication shelter and switchgear structure. Sound emissions were then calculated at various receiver locations on and off site. Locations 1 through 4 are the locations used for the ambient survey. Locations 5 through 10 are site property line locations and Locations 11 through 14 are at the nearest residences. These locations are abbreviated L1 through L14 in the modeling figures.

Transformers

The transformers were modeled using sound power level data for all fans operating to simulate worst-case sound emissions. Manufacturer's sound data sheets show all three units will have a maximum NEMA* rating of 60 dB(A). Figure 18 shows the resulting modeled sound emissions for the three proposed transformers. A color legend is provided as well as the A-weighted sound level result at receptor locations.

* NEMA = National Electrical Manufacturers Association

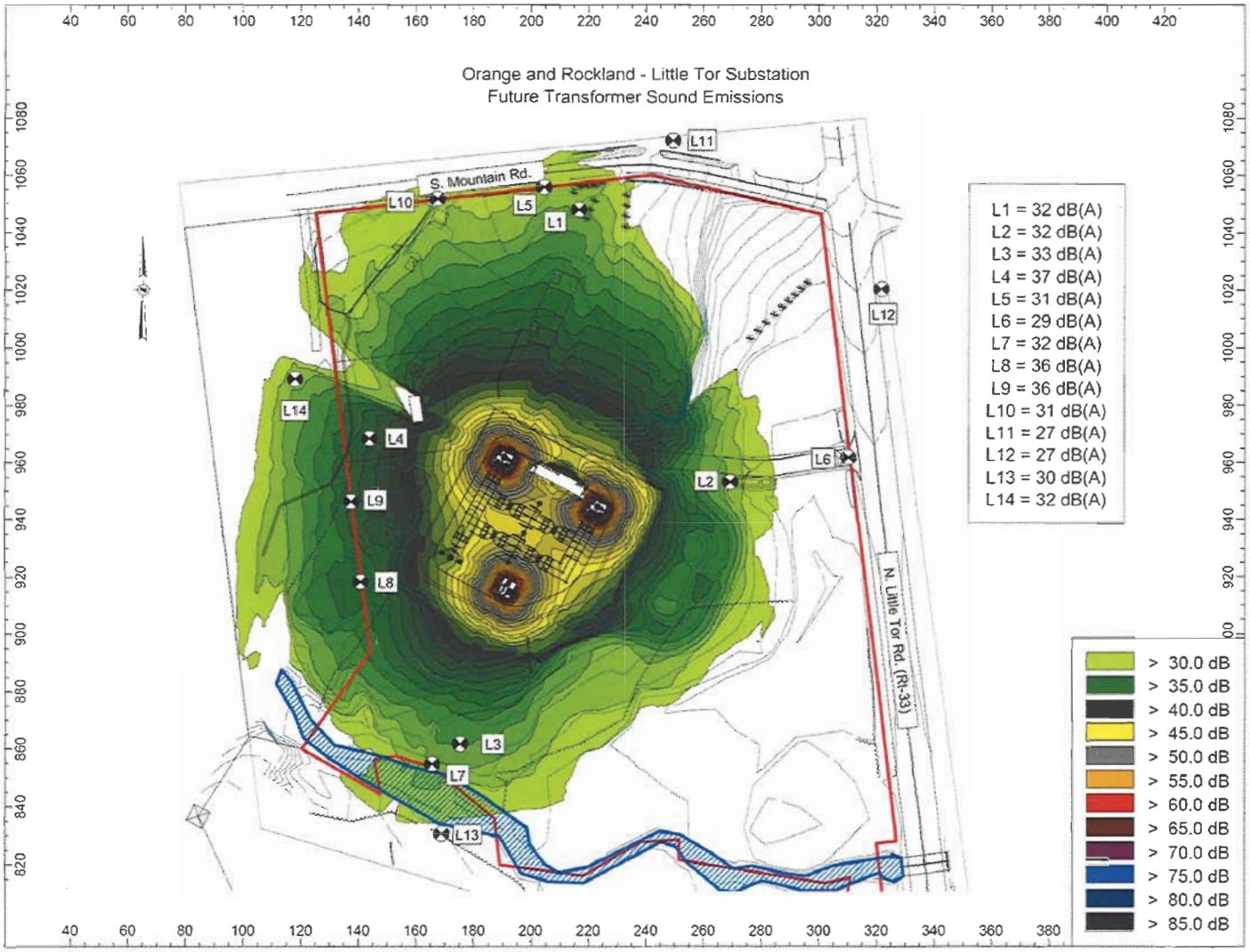

Figure 18 — A-weighted sound emission contours 5 feet above grade with all transformer cooling fans ON, Little Tor Substation.

Transformer noise is typically characterized by a "hum" at two times and four times the 60 Hz line frequency, or 120 and 240 Hz, as well as broadband fan noise which typically affects the mid-frequency ranges typified by the 500 and 1000 Hz octave bands. Transformers produce noise steady in nature and operate 24-hours a day. Because transformers have a tonal component, the more stringent criteria of 41 dB(A) per the Clarkstown noise code is appropriate. As shown in Figure 18, Locations 5 through 14 are all below 41 dB(A) and comply with the local code in both octave bands and A-weighted levels. Transformer noise is steady and therefore does not vary much over time. Therefore, the maximum emissions calculated are equal to the L_{10} level. When comparing transformer emissions to the county noise code limits, all property line locations are below the daytime and nighttime code.

Gas Regulator Stations

A gas regulator station, which includes both monitor and worker regulators, is located in the northwest corner of the site. The gas regulators operate 24-hours a day and produce noise relative to the inlet pressure of the natural gas at the regulator. Sound pressure level measurements were obtained during the day on 8 January to model existing emissions of the station. Gas regulator noise is predominantly high frequency noise, affecting 1000 Hz and above. The resulting sound emission contours are shown in Figure 19. The sound pressure level at the north property line, Location 10, is 61 dB(A) and exceeds both the local and county noise code.

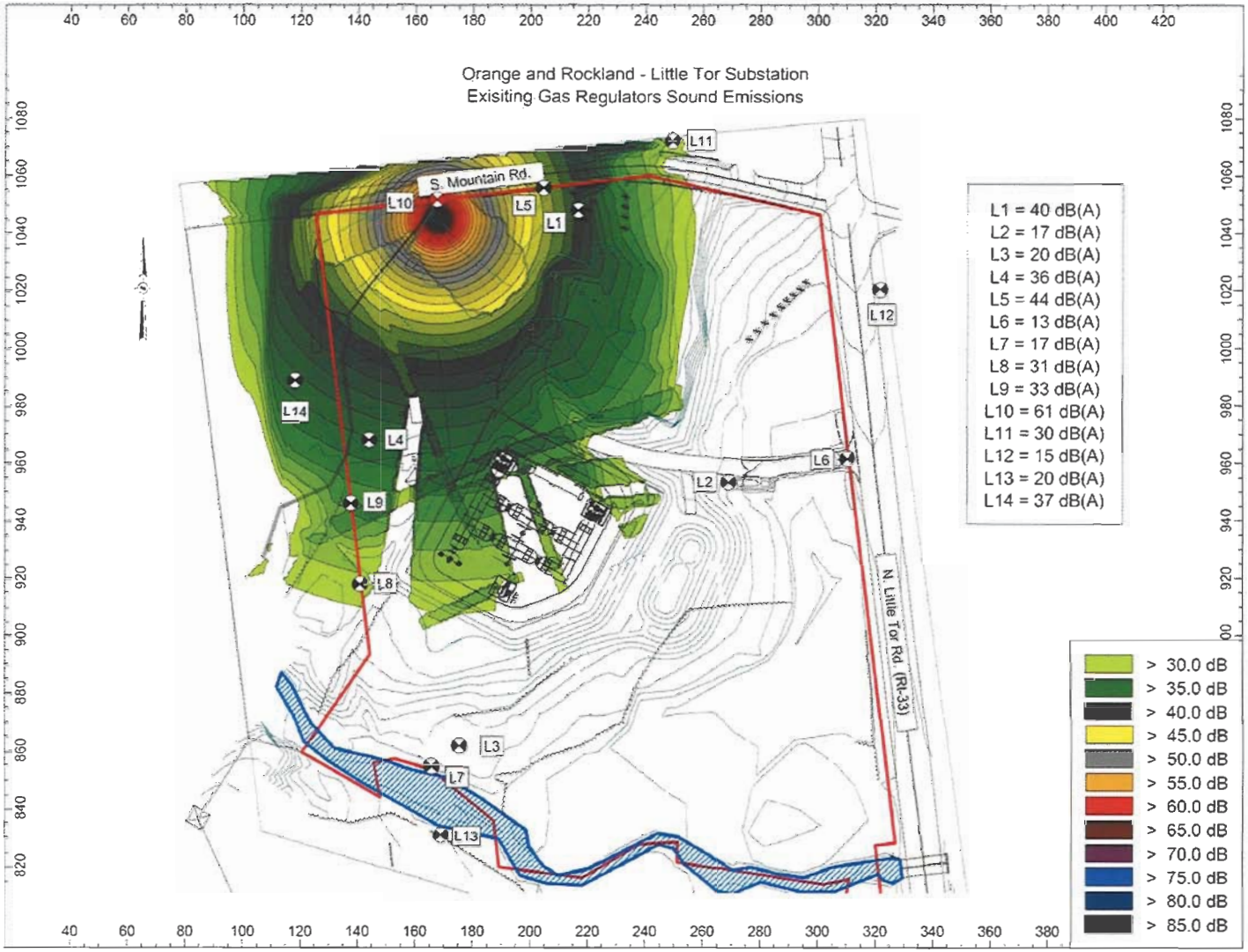

Figure 19 — A-weighted sound emission contours 5 feet above grade for existing gas regulator station, Little Tor Substation.

As part of the proposed work, the existing gas regulator station will be removed and replaced with separate monitor and worker gas regulator stations located more central on site. The monitor and worker regulators are in series and located 50 feet apart. The monitor station is closer to South Mountain Road. There are two regulators per station but only one per station operates at a time, as the other is redundant in case of emergency or repairs.

The regulators produce noise in proportion to the inlet gas pressure at the regulator. Monitor regulators are inversely proportional to the inlet pressure, that is when the pressure is low they produce more noise. The worker regulators are proportional to the inlet pressure and produce more noise with greater inlet pressure. Manufacturer's sound data for the regulators in these conditions were used in the model. Figures 20 and 21 provide the sound emission contours for the two gas pressure conditions: high inlet pressure and low inlet pressure. In addition, the noise produced from the three transformers is also included since it is the whole site that must comply with noise code regulations.

Although the transformer emissions alone comply with the local and county noise regulations, the addition of the gas regulators results in site emissions that exceed the local code limits (Figures 20 through 21). Comparing site sound emissions with the local criterion of 41 dB(A), Location 5 exceeds by 7 dB(A) and by 19 dB at 4000 Hz. At several other property line locations sound levels will exceed the octave band criteria as well. The gas regulator stations will require remediation to bring the site into compliance with the local code. The emissions in Figures 20 and 21 comply with the county noise code by a wide margin and all property line locations are below the most stringent county noise code requirement of 50 dB(A).

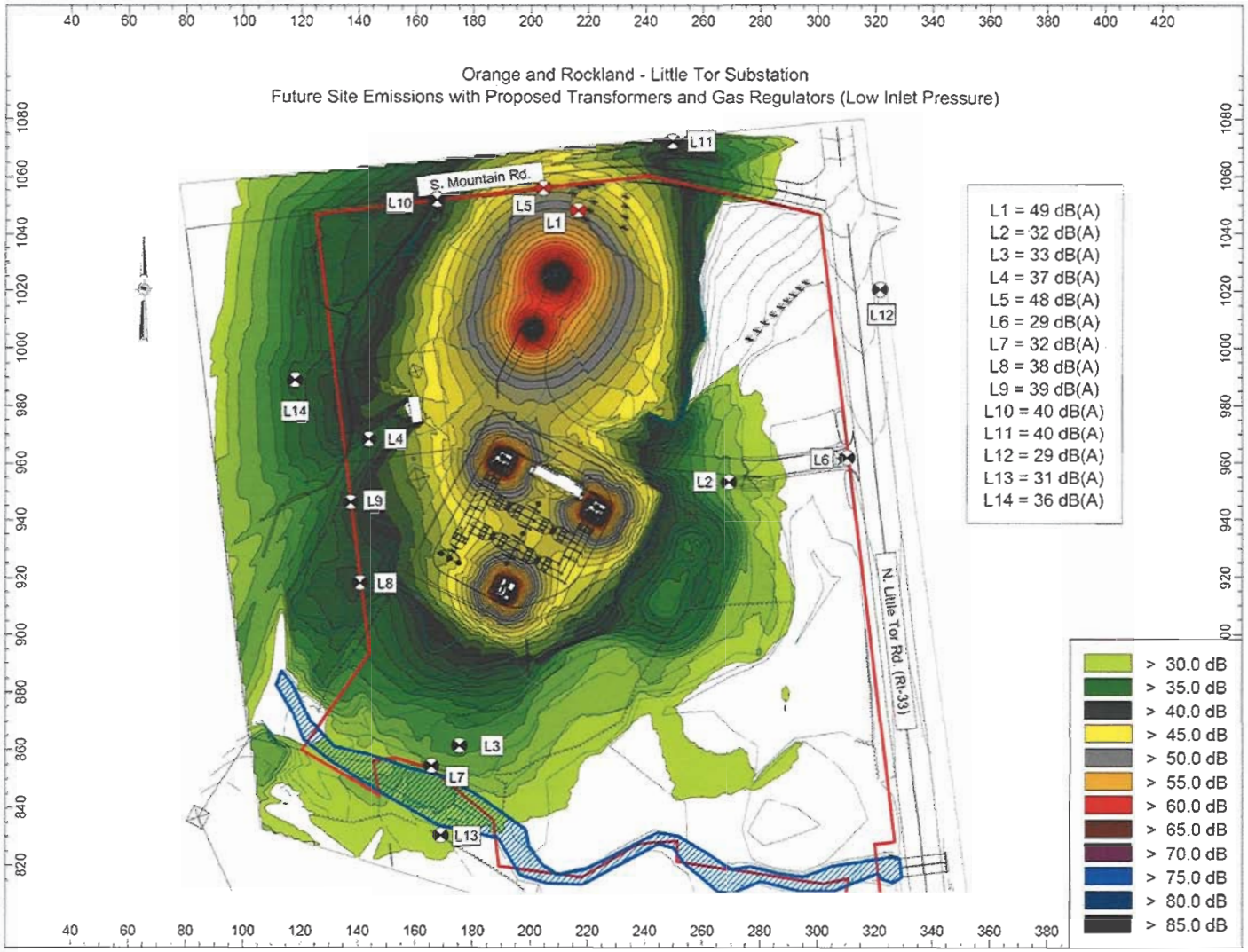

Figure 20 — A-weighted sound level contours 5 feet above grade for proposed transformers and gas regulator stations operating under low inlet pressure condition, Little Tor Substation.

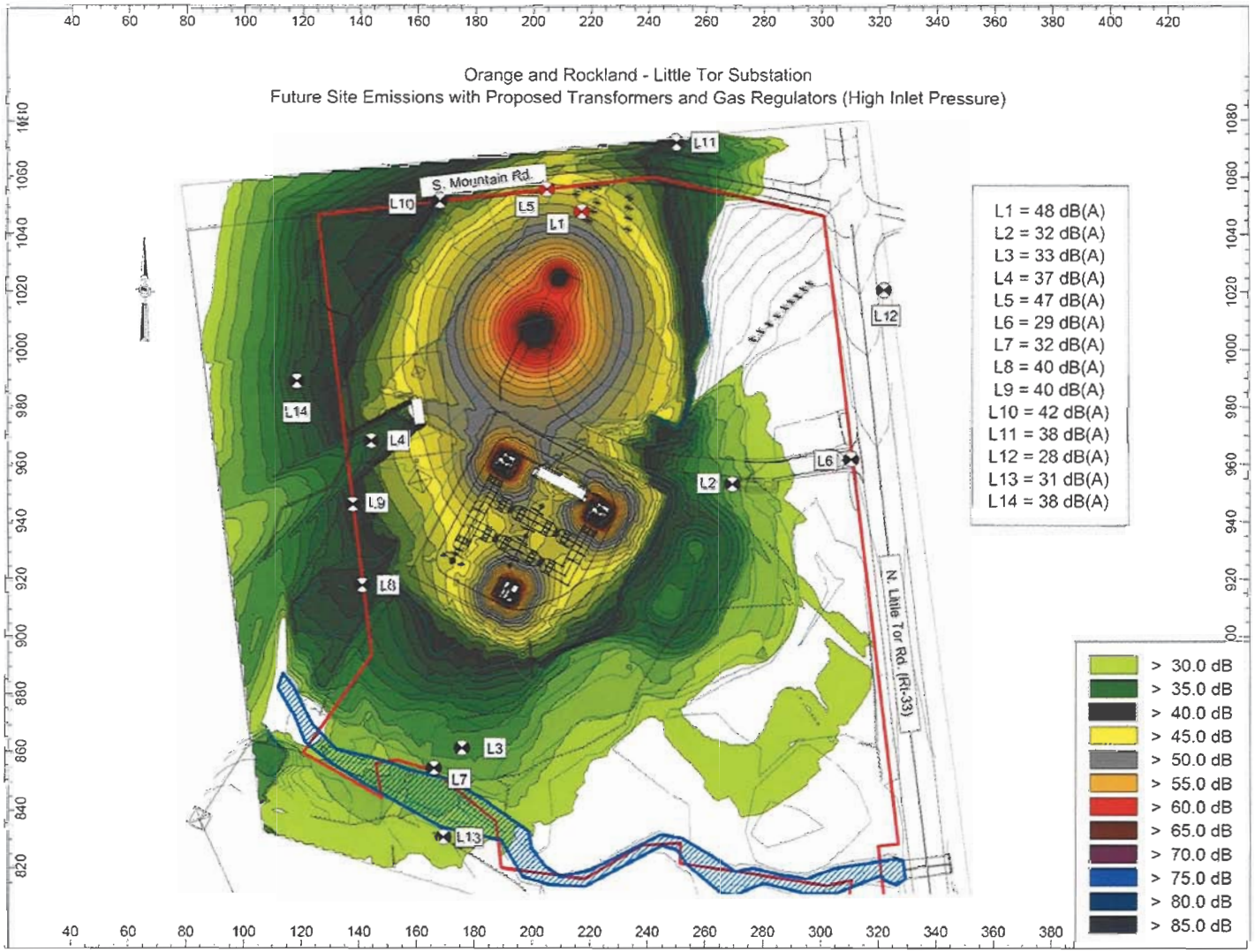

Figure 21 — A-weighted sound level contours 5 feet above grade for proposed transformers and gas regulator stations operating under high inlet pressure condition, Little Tor Substation.

IX. ACOUSTICAL IMPACT

Comparison of the projected future emissions at nearby residences to the measured nighttime ambient is indicative of the acoustical impact of the proposed site. The highest emissions at Locations 11 through 14 (From Figures 20 and 21) were compared with the measured nighttime background sound data (Table 1). Results are shown in Figures 22 through 25. At all locations, the future site emissions are well below the ambient at 1000 Hz and below. Figures 22 and 25 to the north and west respectively, show emissions exceeding the ambient by 5 to 6 dB at 4000 Hz and above and will be noticeable. This high frequency noise is due to the gas regulators. Figure 23 shows high frequency emissions equaling the nighttime ambient, which means site noise will be just noticeable. There will be no acoustical impact at residences to the south as shown in Figure 24 where all emissions are well below the nighttime ambient.

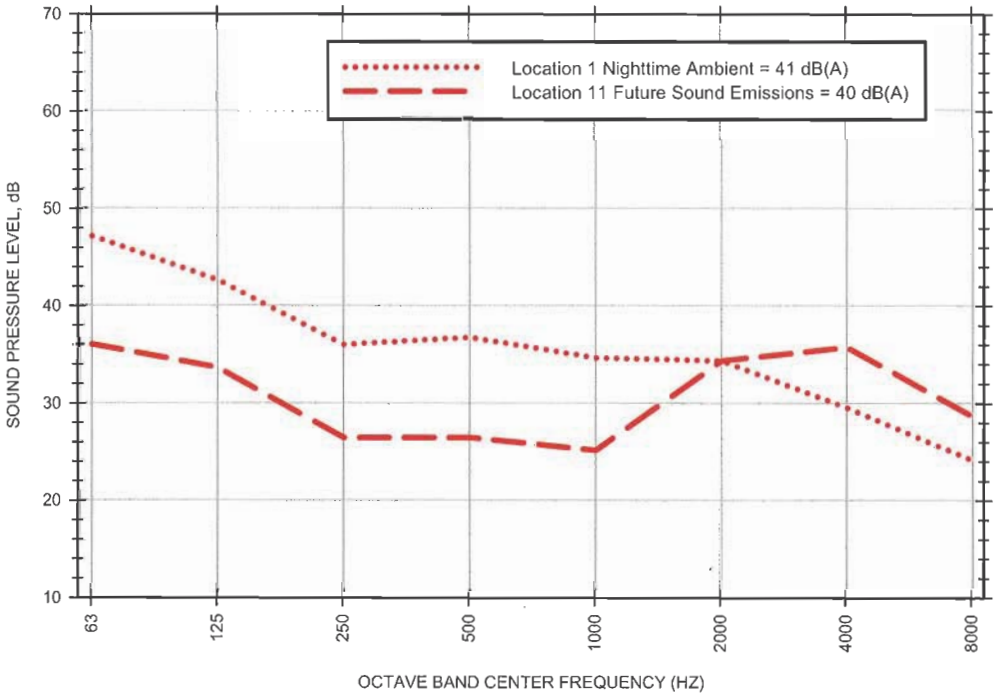

Figure 22 — Comparison of future site emissions to nighttime ambient at Location 11, the nearest residence to the north.

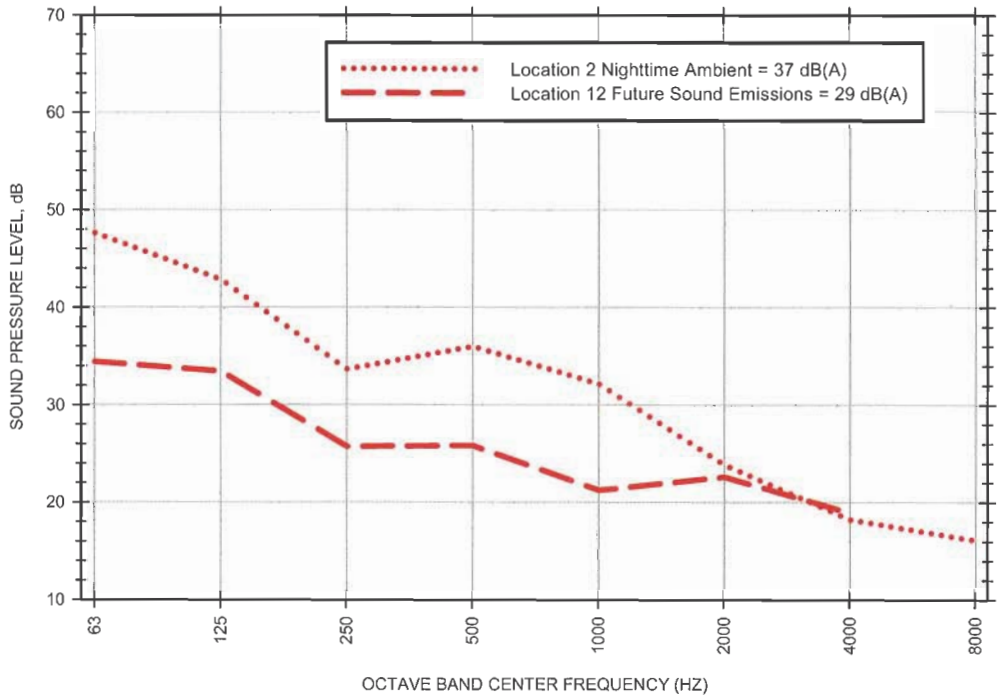

Figure 23 — Comparison of future site emissions to nighttime ambient at Location 12, the nearest residence to the east.

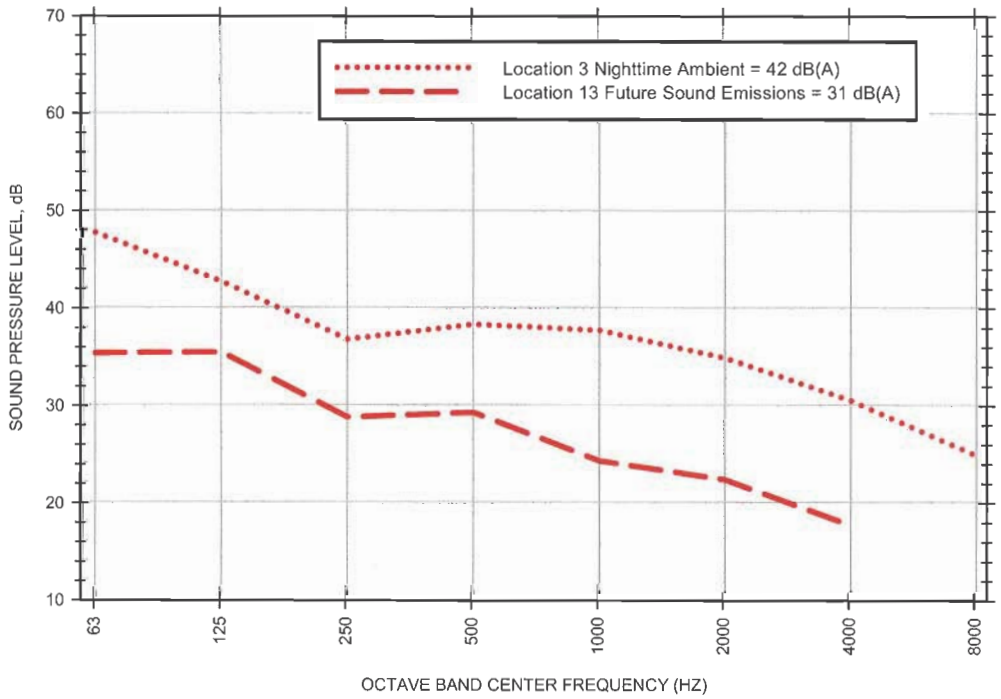

Figure 24 — Comparison of future site emissions to nighttime ambient at Location 13, the nearest residence to the south.

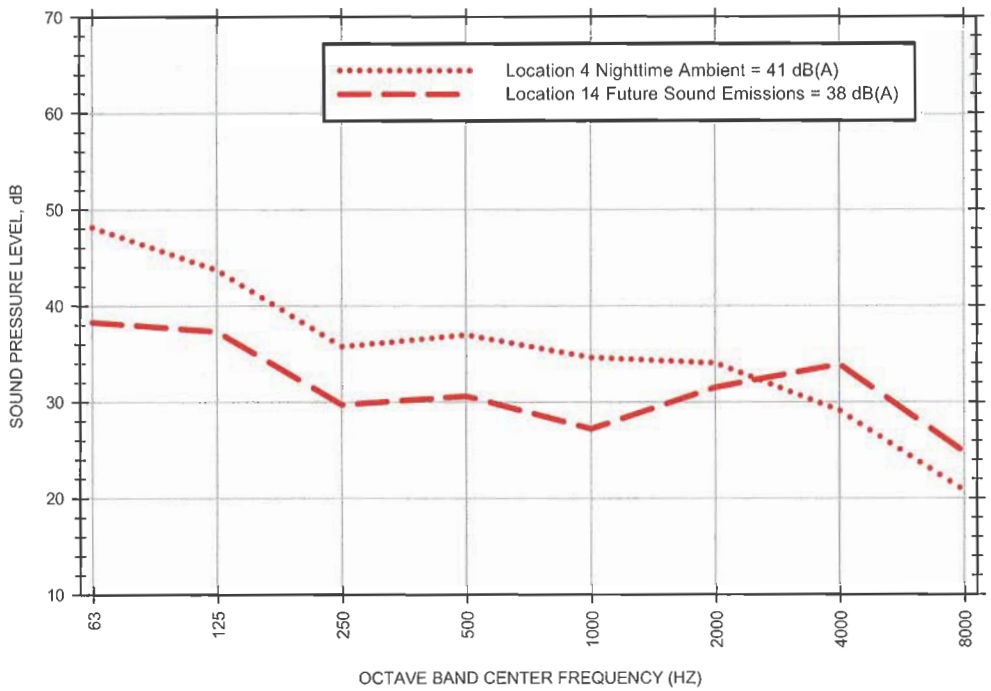

Figure 25 — Comparison of future site emissions to nighttime ambient at Location 14, the nearest residence to the west.

X. CONCLUSION

Based on the above analysis, the sound contributed by the proposed Little Tor substation will exceed the local Clarkstown noise regulation at property line locations to the north and west. This is due to the two gas regulator stations on the north portion of the site. Noise control is recommended for these noise sources. Mitigation can be provided in the form of an acoustical barrier to shield regulator noise from the property line and residential receptors.

As the site is currently proposed with all transformers and gas regulator stations, there will be no acoustical impact to residences to the south and a minor impact to the east. The greatest acoustical impact will occur to the north and west and predominately affect the high frequency octave bands, from 2000 Hz to 8000 Hz. The site emissions are expected to raise the ambient by 4 to 6 dB in these octave bands and will be noticeable.

APPENDIX A

INSTRUMENTATION

The measurements were carried out using Larson-Davis Model 720 and 820 automated noise monitors. The monitors were programmed to sample the noise 8 times every second and record the average noise level derived from those measurements every minute. The monitors also store hourly statistics including the maximum, minimum, and average noise levels that occur during each hour.

The monitors were calibrated before and after the survey by means of a sound pressure level calibrator. The calibrator used was a Bruel & Kjaer Model 4230, Serial Number 909520, last calibrated by an outside calibration service in October 2009. This calibration is traceable to the National Institute of Standards and Technology, NIST.

Two graphical displays are presented in this report. The time history graphs show the minute-by-minute average sound readings at each location for a period of 24 hours. From this type of display, we can identify unusual noise occurrences. The statistical graphs show the hourly statistics obtained at each location over 24 hours. This is useful to identify how noise varied over the course of an individual hour.

Octave band sound levels were measured with a Bruel & Kjaer 2250 real-time sound analyzer. The analyzer was programmed to measure and store sound levels every second for 10 minutes. The statistical distribution of sound was calculated from these six hundred samples. The analyzer was calibrated before and after each survey using a Bruel & Kjaer Model 4231, Serial Number 2445631 last calibrated by an outside calibration service in August 2009.

Overall the data reported here can be considered accurate to the nearest decibel.

OSTERGAARD
ACOUSTICAL
ASSOCIATES

200 Executive Drive
W Orange NJ 07052
Voice 973-731-7002
Fax 973-731-6680
acousticalconsultant.com

VIA MAIL & EMAIL lanzaj@oru.com

12 April 2010

Ms. Joanne Lanza, Electrical Engineer
Transmission & Substation Engineering
Orange and Rockland Utilities, Inc.
390 West Route 59
Spring Valley, NY 10977

Re: Gas Regulator Noise Mitigation
Little Tor Substation, Clarkstown, New York
OAA File 3599B

Dear Ms. Lanza:

As requested, we have evaluated noise control options to bring the gas regulator stations into compliance with the local and county noise code. The site currently contains a gas regulator station in the northeast corner of the site. Plans call for a new electric substation and relocating and reconfiguring the regulators to two separate stations, a worker station and a monitor station. The worker station will be moved to the northernmost station nearer to South Mountain Road. The monitor station will be 50 feet south of the worker station. The site and equipment locations are shown in Figure 1, based on aerials obtained from Google Earth.

Figure 1 — Site and vicinity with existing and future equipment locations shown.

The details and results of our acoustical impact analysis of the existing and proposed site plans were given in our 1 February 2010 report. Our findings showed that the existing gas regulator station exceeds both county and local noise codes at the nearest property line. Calculations show that the proposed regulators in the new locations, while farther from the property line, will still exceed the local noise code of 46 dB(A). Mitigation is needed to bring the gas regulator stations into compliance.

Two gas pressure conditions are accommodated, high inlet and low inlet, which affect the noise produced by the regulators. The low inlet condition results in higher sound contributions at the north property line and is the focus of our noise control efforts. Figure 2 is taken from our 1 February report and shows the future sound emissions with gas regulators under low inlet pressure, without noise control.

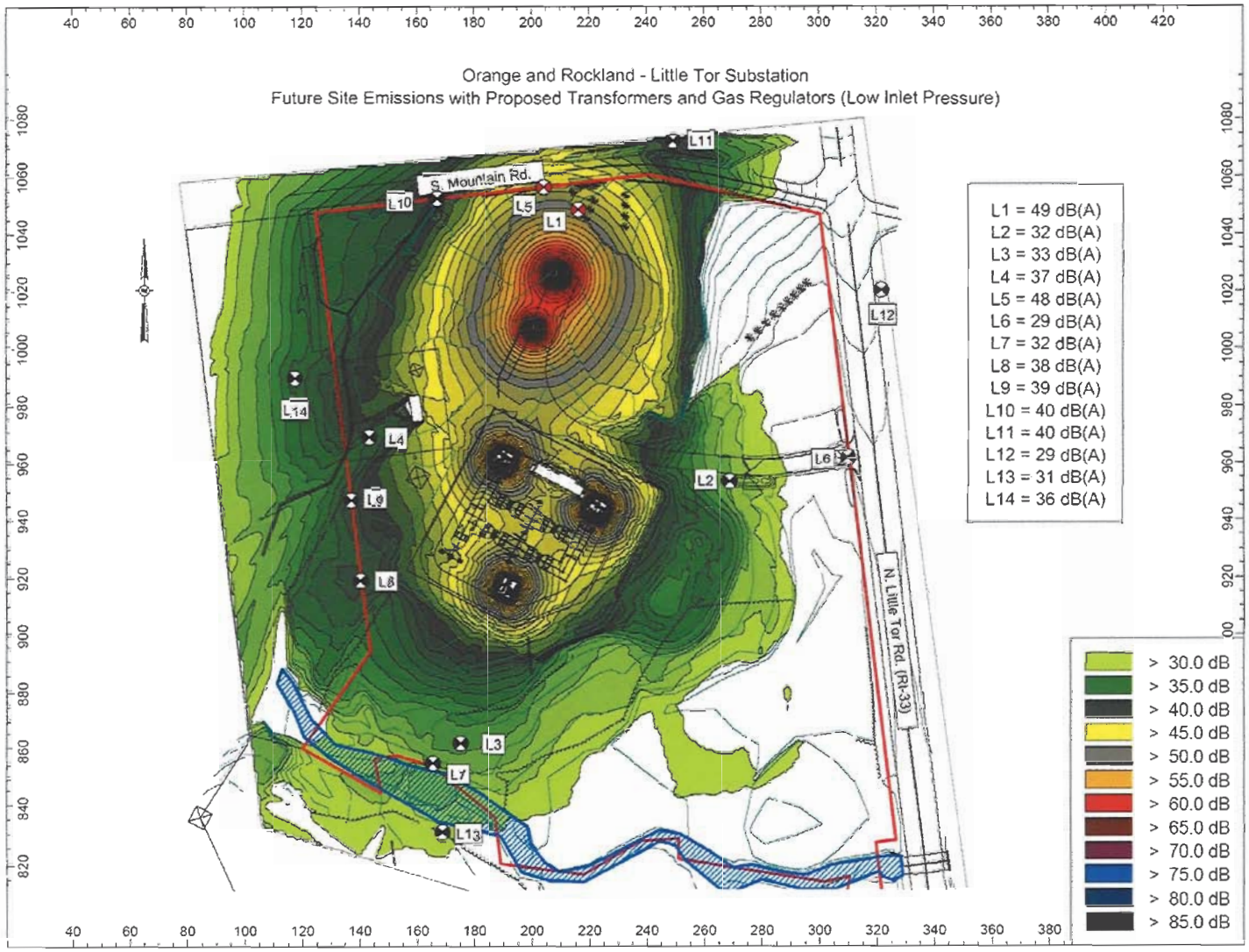

Figure 2 — A-weighted sound emission contours 5 feet above grade at Orange and Rockland Little Tor site. Proposed transformers and gas regulator stations operating under low inlet pressure condition.

APPLICABLE REGULATIONS

The local noise code of Clarkstown, New York is given in Chapter 205 Noise, and Chapter 290-13, Performance Standards. Chapter 205 is a nuisance noise ordinance and does not include quantitative noise limits. For a residential district, Chapter 290-13 specifies a nighttime noise limit of 46 dB(A) from 2200 hours to 0700 hours measured 25 feet from the principal on-site building. Because there is no principal building on site, we used the 46 dB(A) limit at the substation property line. This limit is reduced to 41 dB(A) for noises of periodic character such as a hum. There are also limits in octave frequency bands.

Article IX of the Rockland County Sanitary Code also provides noise limits in section 9.8.2. This section limits noise produced at a residential property line to a maximum sound pressure level of 65 dB(A), or L_{10} of 60 dB(A), during the day, from 0700 hours to 2200 hours. This limit is reduced to a maximum sound level of 55 dB(A), or L_{10} of 50 dB(A), at night, from 2200 hours to 0700 hours.

The State of New York has not implemented a state-wide noise code.

MITIGATION

Where there is insufficient distance for equipment sound emissions to meet codes, mitigation needs to be investigated and implemented. Sometimes it is possible to procure quieter equipment. For this application, I understand that equipment has already been purchased, so that the only option for mitigation is to interpose screening between the noise sources and receptor locations where code limits need to be met. The screening is customarily in the form of acoustical barriers.

To be effective, acoustical barriers need to have the following characteristics:

- Sufficient sound transmission loss so that sound reaching the other side is forced to travel over, not through, the barrier panel.

- A sound absorptive surface facing the noise source. This is important in suppressing reflections to other areas and reducing the build-up of sound between the noise source and barrier.

- Tall and long enough so that sufficient shadowing of sound is achieved at receptor vantage points.

Note that all three of the above barrier characteristics are a function of frequency. Higher frequencies, like those produced by the regulators, are easier to block and absorb, whereas lower frequencies are more difficult to control. The gas regulators produce the highest levels in the 2000 Hz and 4000 Hz octave bands.

In addition to acoustical considerations, barrier placement needs to be sensitive to clearance requirements established by Orange and Rockland for access and maintenance of equipment. To accommodate this, the barrier should be located in place of, or outside of, the proposed fence surrounding the regulators.

Manufacturer's sound data were used in the acoustical model to simulate the worst-case low inlet pressure flow condition, which results in the highest noise level. Normal operating flow conditions will produce lower sound levels.

There are many possible configurations for barriers that can successfully mitigate conditions. The objective is to minimize the extent of barrier to minimize costs. Figure 3 shows a barrier configuration that introduces an 8-foot U-shaped length of barrier around each regulator station with the regulators operating at the worst-case low inlet pressure. The concept is to shield the property line from the noise source. The results show that in addition to being below the nighttime noise code limit of 46 dB(A), there is compliance in all octave band frequencies including at 2000 and 4000 Hz.

Each barrier should be carried 8 feet above grade and follow the outline of the proposed security fences, nominally 15′ x 20′ in plan. For both stations, the south segment is 15 feet and the west segment is 20 feet in length. The barrier for the north Worker Regulator station has a longer north segment, which is 20 feet in plan. The north segment of the Monitor Regulator station is 15 feet.

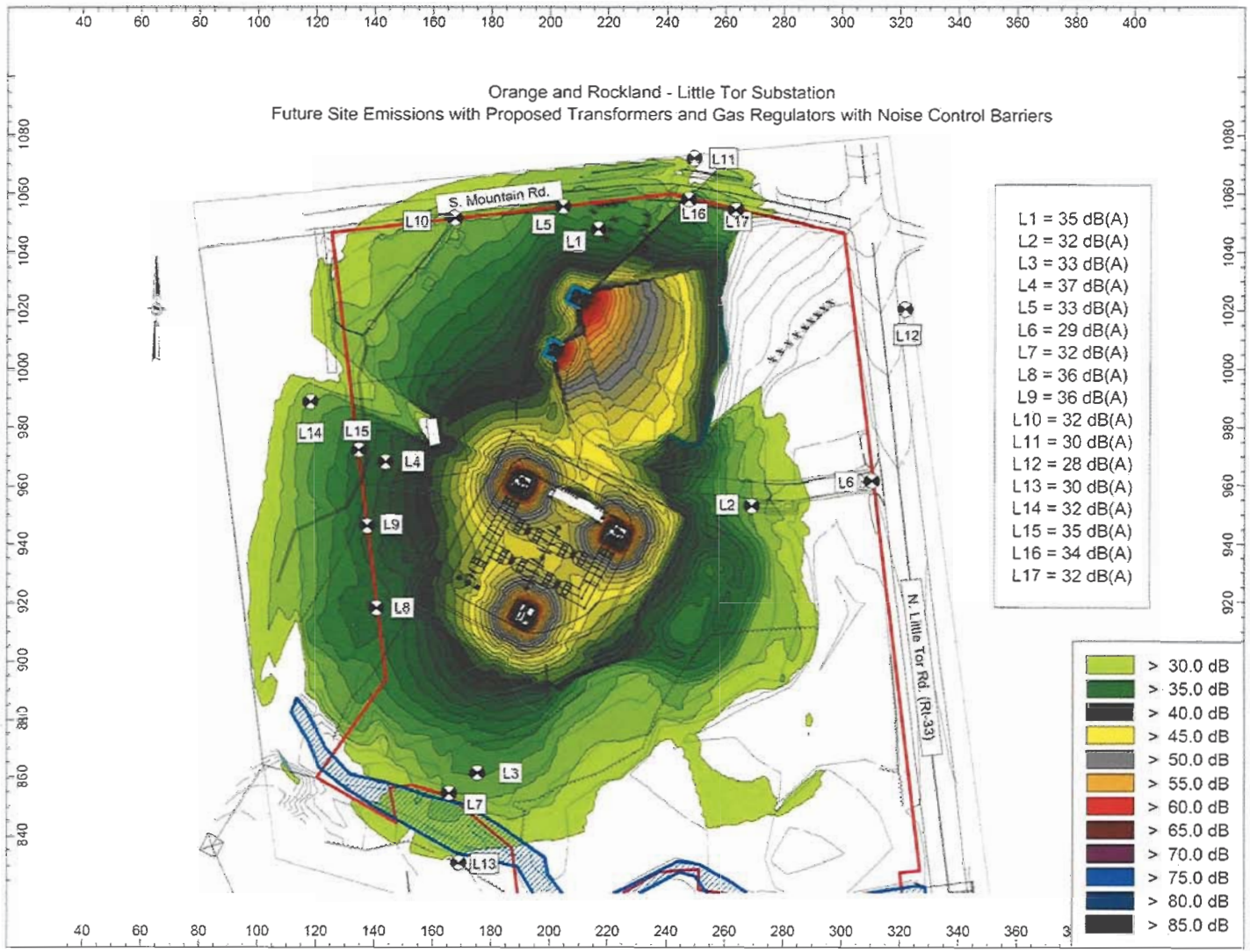

Figure 3 — A-weighted sound emission contours 5 feet above grade at Orange and Rockland Little Tor site. Future conditions with substation and gas regulators under worst-case low inlet pressure with U-shaped barriers shown in light blue.

BARRIER IMPLEMENTATION

The important acoustical characteristics for acceptable noise control barriers, in addition to the minimum height of 8 feet and the 3-sided layout shown in Figure 3, are as follows:

- The barrier needs to force sound to go over the panel, not leak through it. Therefore acceptable barrier materials need to be solid and have a minimum surface weight of 4 lbs/ft^2 for this application.

- The barrier needs to seal well to the ground so that sound does not leak under the barrier.

- A sound absorptive inner face, facing the regulators, is necessary for this application.

Hence, acceptable barriers can be constructed using precast or cast-in-place concrete lined with sound absorptive material such as 3-inch thick M-90 panels by Empire Acoustical Systems. Also acceptable are acoustical metal panels from manufacturers such as Aeroacoustic or Industrial Acoustics (IAC), or special systems such as the Sound Fighter LSE System from Noise Abatement Technologies. Because the noise reduction demands are not stringent, a good fit for this project are non-metallic (PVC) acoustical barriers. The ArtUSA Silent Protector Barrier has the aesthetics of a PVC fence on the exterior but has acoustical fill and a perforated interior.

The attached acoustical specification summarizes the required important characteristics for manufactured barrier products. A convenient means to seal to the ground is to bring the barrier panels in contact with existing or new gravel and infill any gaps from both sides of the panel with pea gravel.

The barrier needs to accommodate access to the equipment for both occasional inspection or more complex maintenance operations. Orange and Rockland needs to clarify access requirement and oversee placement of acoustical compatible man-doors or larger access panels. Ostergaard Acoustical Associates is prepared to work with Orange and Rockland and the chosen supplier to insure that access meets both acoustical and operational needs.

Regardless of which manufactured barrier product is under consideration by Orange and Rockland, Ostergaard Acoustical Associates should be asked to review product submittals before the project is released for construction.

Ostergaard Acoustical Associates should also be asked to review bid documents and Orange and Rockland's drawings, prior to release for pricing, to insure correct interpretation of our recommendations and to allow updating of our acoustical model. Structural and other non-acoustical aspects of the installation need to be overseen by qualified professionals at Orange and Rockland.

❑ ❑ ❑ ❑

I trust the above is useful to you and look forward to answering any questions you might have.

Sincerely yours,

OSTERGAARD ACOUSTICAL ASSOCIATES

Benjamin C. Mueller, P.E.
Senior Engineer

BCM:amc

Enclosure

ACOUSTICAL SPECIFICATION
ACOUSTICAL BARRIER FOR SCREENING GAS REGULATORS
ORANGE AND ROCKLAND LITTLE TOR SUBSTATION, CLARKSTOWN, NEW YORK

An acoustical barrier is needed to reduce the noise radiated to the community from two gas regulator stations associated with the site. The acoustical panels shall be 2¾-to-6-inch thick standard panels with one solid panel face and one sound-absorptive face comprising perforated panel over glass fiber insulation.

Sound Transmission Loss
The panel shall, at a minimum, have the following sound transmission loss when tested in accordance with ASTM Test Method E 90:

1/3 Octave Band Center Frequency (Hz)	***125***	***250***	***500***	***1000***	***2000***	***4000***
Minimum Transmission Loss (dB)	*16*	*20*	*26*	*35*	*35*	*29*

Sound Absorption
The perforated face of the panel shall, at a minimum, have the following sound absorption coefficients when tested in accordance with ASTM Test Method C 423:

1/3 Octave Band Center Frequency (Hz)	***125***	***250***	***500***	***1000***	***2000***	***4000***
Minimum Absorption Coefficient	*.40*	*.80*	*.85*	*.85*	*.80*	*.70*

Construction
The barrier shall be fabricated to withstand exterior conditions. The acoustical insulation shall be water resistant glass fiber. A thin (3 mil maximum) plastic or mylar layer may be used to protect the insulation provided that absorption requirements are met.

Installation
The sound absorptive face shall be oriented toward the noise source.

Products Expected to Meet These Requirements

Model LSE noise barrier wall system by Noise Abatement Technologies
Model 4P Silentbarrier panels by Aeroacoustic.
3-inch thick Silent Screen panels from Empire Acoustical Systems
Model FSt/S panels by Industrial Acoustics Co.
STC-31 Silent Protector Absorbent Wall by ArtUSA

Manufacturers

Noise Abatement Technologies, Edison, New Jersey, (732) 287-2755.
The Aeroacoustic Corporation, Roselle, New Jersey, (800) 842-2376.
Empire Acoustical Systems, Gatesville, Texas, (254) 404-9000
Industrial Acoustics Co., Bronx, New York, (718) 931-8000
ArtUSA, Atlanta, Georgia, (770) 246-7827

SIZING CALCULATION

Control Associates, Inc.

Contact:
RFQ:
Project:

Contact: **BILL MULVIHILL**
Quote: **6075O&R** Rev: **00** Date: **17 MAR 06**

Item: 001 - VALVE/REGULATOR SIZING CALCULATION: Fisher Ideal Gas
Item Desc: **4 Inch EZR**
Tags: **4" EZR MONITOR**

SERVICE & SIZING	**Minimum**	**Normal**	**Maximum**
Gas Name	nat gas	nat gas	nat gas
Inlet Pressure (psig)	150.000	210.000	250.000
Pressure Drop (psid)	18.702	13.106	10.975
dP/P1 Ratio	0.113	0.0584	0.0415
Atm. Pressure (psia)	14.400	14.400	14.400
Specific Gravity (SG)	0.600	0.600	0.600
Specific Heat Ratio, k	1.320	1.320	1.320
Temperature (deg F)	60.000	60.000	60.000
Gas Flow Rate (scfh)	600000.000	600000.000	600000.000
Recovery Factor, C1	38.700	38.700	38.700
Gas Sizing Coefficient, Cg	5690.000	5690.000	5690.000
dP Critical (psid)	100.942	137.782	162.342
NOISE CALCULATION			
Fisher Valve/Reg Trim Type	EZR	EZR	EZR
Downstream Pipe Size (in)	4.000	4.000	4.000
Downstream Pipe Schedule	80	80	80
Valve/Reg LpA (SPL) (dB(A))	81.9	77.5	75.3
WARNING:	ACCEPTABLE	ACCEPTABLE	ACCEPTABLE

Notes: **SZNG: The above sizing indicates the calculated pressure drop of a 4" EZR (standard trim, green main valve main spring, 17E97 diaphragm, min diff=34, max diff press=500 psid, available Cg=5,690 at 100% travel, C1=38.7) when utilized as a first stage wide-open monitor at inlet pressures of 150 psig (min), 210 psig (norm), and 250 psig (max), with a flowrate of 600,000 scfh. The calculated pressure drop and the pressure downstream of the monitor (which is the pressure upstream of the worker, or intermediate pressure) are as follows:**
P1=150# (min P1), delta P = 19 psid, Pint=131#
P1=210# (norm P1), delta P = 14 psid, Pint=196#
P1=250# (max P1), delta P = 11 psid, Pint=239#
Note noise calcs for the monitor with sched 80 piping.

SIZING CALCULATION

Control Associates, Inc.

Contact:
RFQ:
Project:

Contact: **BILL MULVIHILL**
Quote: **6075O&R** Rev: **00** Date: **17 MAR 06**

Item: 002 - VALVE/REGULATOR SIZING CALCULATION: Fisher Ideal Gas
Item Desc: **4 Inch 1098H-EGR**
Tags: **4" 1098 WORKER**

SERVICE & SIZING	**Minimum**	**Normal**	**Maximum**
Gas Name	nat gas	nat gas	nat gas
Inlet Pressure (psig)	131.000	196.000	239.000
Pressure Drop (psid)	61.000	126.000	169.000
dP/P1 Ratio	0.419	0.598	0.666
Atm. Pressure (psia)	14.400	14.400	14.400
Specific Gravity (SG)	0.600	0.600	0.600
Specific Heat Ratio, k	1.320	1.320	1.320
Temperature (deg F)	60.000	60.000	60.000
Gas Flow Rate (scfh)	600000.000	600000.000	600000.000
Recovery Factor, C1	34.800	34.800	34.800
Gas Sizing Coefficient, Cg	3567.476	2275.974	1860.728
dP Critical (psid)	80.770	116.877	140.764
NOISE CALCULATION			
Fisher Valve/Reg Trim Type	1098-EGR WHI	1098-EGR WHI	1098-EGR WHI
Downstream Pipe Size (in)	4.000	4.000	4.000
Downstream Pipe Schedule	80	80	80
Valve/Reg LpA (SPL) (dB(A))	78.3	81.7	83.8
WARNING:	ACCEPTABLE	ACCEPTABLE	ACCEPTABLE
Recommended Velocity Limit (Mach)	0.500	0.500	0.500
Minimum Outlet Area (in2)	5.722	5.722	5.722
Minimum Outlet Inside Diam. (in)	2.699	2.699	2.699

Notes: **SZNG: The above sizing indicates the calculated required Cg (the required capacity) of the worker regulator when Item 1 is utilized as the first stage wide-open monitor. The required Cg's are calculated with intermediate pressures (inlet pressure to second stage worker) of 131 psig (min), 196 psig (norm), and 239 psig (max), flowrate of 600,000 scfh, and a 70 psig set. The calculated required Cg is as follows: Pint=131# (when min P1=150#), required Cg=3,567 Pint=196# (when min P1=210#), required Cg=2,275 Pint=239# (when min P1=250#), required Cg=1,860 A 4" 1098 (WHISPER trim, red main spring, 30H actuator, min dp=22 psid, max dp=400 psid, available Cg=6280, C1=34.8) has adequate capacity. Note the reduced noise calcs with WHISPER trim sched 80 pipe.**

POTENTA Environmental Consultants, LLC.
Engineers, Environmental Specialists

xRG
xPB, xJC, xDEC,
xBI, xDTA, xMontalbano
file

September 15, 2011

RECEIVED
SEP 14 2011
TOWN PLANNING DEPT

Ms. Shirley Thormann
Chairwoman-Planning Board
Town of Clarkstown
10 Maple Avenue
New City, New York 10956

RE: Comments on DEIS/Acoustical Impact Study
- Orange and Rockland Utilities, Inc.
Proposed Little Tor Substation Project
Town of Clarkstown, Rockland County, N.Y.
PEC Project No. 11570

Dear Ms. Thormann:

This letter report provides review comments on the noise sections of the SEQRA DEIS prepared by CMX dated April 2011 for the subject project including the technical noise report prepared by Ostergaard Acoustical Associates dated February 2010 regarding the potential noise impacts of the proposed substation to be located in the Town of Clarkstown, New York.

DEIS Report

The DEIS document text pp.I-5 and III.J87-92, summarizes the conclusions of the project noise report. Therefore any revisions to the technical noise report (in Appendix C) based on the applicant's response to comments below should be reflected in the above noted DEIS sections.

1) Page III.J-91-There is no detailed documentation provided in the DEIS/Appendix C for the noise mitigation analysis summarized in the DEIS text which recommends an 8-foot high noise barrier around the two gas regulators. Model input and output summary sheets supporting the recommended mitigation measure and sound reduction should be submitted for technical review.

Ostergaard Noise Report

1) Page 3-The DEIS was prepared under SEQRA regulations requiring the Lead Agency to consider the potential for adverse environmental impacts. The NYSDEC has an established Program Policy entitled *Assessing and Mitigating Noise Impacts* (DEP-00-1, Feb. 2, 2001) applicable for projects under SEQRA review. The relevant noise impact criteria in the NYSDEC guidance document should be given consideration and addressed appropriately when considering potential project impacts and the need for mitigation, in addition to review of compliance with the local ordinance and the Rockland County noise regulations.

2) Page 5-The report should clarify what sources dominating the ambient measurements were included in the noise levels presented, whether they reflect the time period least affected by these

166 Main Street, Flemington, New Jersey 08822 TEL. (908) 782-9716 FAX. (908) 782-2502

identified extraneous sources or the average over the entire daytime and nighttime monitoring periods. The latter appears to be the case which might underestimate the project impact on the ambient nighttime conditions during the more sensitive 2-5AM period on weekends when fewer extraneous sounds affect ambient noise levels. The NYSDEC impact criteria should be addressed for ambient noise levels considering the existing character of the surrounding land use.

3) Page 22-The octave band standards in the local noise code are not provided in the report and should be presented in Table form for ease of comparison with Table 1 ambient level results and later reference for the project impact noise levels and assessment.

4) Page 24-The site modeling methodology describes the use of manufacturer's noise data for the transformer fans and actual measurements of the existing gas regulator units as input data for the proposed sources. This backup information should be included for the equipment sources in the technical report along with a discussion justifying use of the existing unit data for the proposed gas regulator model unit. It should also be clarified whether the noise measurements of the existing gas regulator were taken under maximum operating load conditions.

5) Page 24-The report states that noise modeling was performed but does not identify the noise model that was used. Both model input and output summary sheets should be provided for all receptor sites analyzed.

6) Page 26-The report states that manufacturer's noise data was used for modeling the impact of the proposed gas regulators which appears to be in conflict with the methodology described on Page 24 (see Comment 4) regarding the use of measurement data of the existing regulator onsite.

7) Page 28-The report should define emergency use of the second gas regulator and confirm that it would not involve use under heavy load conditions to reduce the strain on the other operating unit and result in both regulators operating simultaneously.

8) Page 28-No data was provided to review the projected octave band noise levels in comparison with the local standards to conclude project compliance. This information should be provided in graphics for all receptors analyzed showing comparison with the local octave band standards. No summary data for the projected L_{10} noise levels is provided for comparison with the ambient levels and the conclusion of receptor compliance with the Rockland County L_{10} noise standards.

9) Page 31-The assessment criteria for addressing acoustical impact is described as property line standards (Page 3) yet Figures 22-25 only provide the octave band analysis results and maximum SPL for the nearest residences (Sites L11-L14). Explain why the property line noise levels are not addressed in the impact assessment. Similar figures should be provided for both the property line receptors (L5-L10) for comparison with the local maximum and octave band noise standards

and for the measurement sites (L1-L4) for comparison with the ambient data and determination of receptor noise impacts. The graphics should present the local octave band standard as well.

10) Page 33-The supporting data for the mitigation analysis and the recommended noise barrier discussion included in the DEIS is not provided in the technical noise report in Appendix C (see DEIS Comment 1). The documentation should include both analysis input and output results indicating expected noise attenuation levels and a figure showing the recommended noise barrier locations and described orientation.

If you have any questions regarding the above review comments, please do not hesitate to contact me.

Very truly yours,
POTENTA Environmental Consultants, L.L.C.

Edward J. Potenta, Principal
Institute of Noise Control Engineering-Member

OSTERGAARD
ACOUSTICAL
ASSOCIATES

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Fax 973-731-6680
acousticalconsultant.com

VIA MAIL & EMAIL lanzaj@oru.com

7 October 2011

Ms. Joanne Lanza
Transmission & Substation Engineering
Orange & Rockland Utilities, Inc.
390 West Route 59
Spring Valley, NY 10977

Re: Response to 15 September 2011 Review Letter – Potenta Environmental Consultants
Proposed Little Tor Substation, Clarkstown, New York
OAA File 3599A

Dear Ms. Lanza:

At your request, we have reviewed the 15 September 2011 letter from Edward J. Potenta prepared for the Town of Clarkstown and have developed this response. The review letter has numerous comments, but it seems that the issues can be distilled down to these concerns:

- The reviewer asks that our findings take into account the New York State Department of Environmental Conservation (NYSDEC) Program Policy "Assessing and Mitigating Noise Impacts" (2 Feb 2001). The policy is a guideline to determine when project sound emissions may result in environmental impact.

- The reviewer asks that full results be provided in octave bands.

- The reviewer suggests that impact be assessed at the property lines of noise sensitive receptors rather than at dwellings.

- Detailed documentation of our noise mitigation analysis was provided and is found in the DEIS/Appendix C in our 12 April 2010 letter report describing recommended noise mitigation for the gas regulators.

The following supplemental information and discussion is provided in response to the review comments.

1. The reviewer indicates the need for global statistical results, specifically the minimum values, for the 48-hour A-weighted ambient sound level survey. The following table is provided in response. All entries are A-weighted sound levels in dB re 20μPa.

	Average of 48 Hourly Values							48-Hour	
Location	L_{eq}	L_{max}	L_{10}	L_{33}	L_{50}	L_{90}	L_{min}	L_{max}	L_{min}
1	52	87	53	50	49	47	45	93	42
2	49	85	59	52	46	43	33	92	29
3	45	81	50	46	45	44	43	83	42
4	43	79	45	42	41	39	39	86	38

2. Figure 3 of our 12 April 2010 letter report, provided for reference in Attachment A, provides the modeled worst-case future site sound emissions with mitigation of sound from the gas regulators. The mitigation is in the form of U-shaped acoustical barriers placed around each regulator and is fully discussed in the 12 April 2010 letter. To clarify the acoustical model, the model was created using CadnaA. Transformers were modeled using manufacturers' worst-case NEMA sound ratings, that is with all cooling fans ON. The NEMA ratings were converted to octave band sound power levels using the EEI Method given in Reference 1. Existing gas regulators were modeled using acoustical data measured by Ostergaard Acoustical Associates in the field. Future regulators were modeled using worst-case A-weighted sound levels ratings from the manufacturer, with the spectrum shaped to mimic the sound produced by the existing regulators surveyed in the field.

3. Using the 48-hour minimum A-weighted sound level ambient values given in ¶2 above, and results from Figure 3 in Attachment A, it is possible to consider the potential acoustical impact of the site development in each direction:

   - To the north, the lowest ambient A-weighted sound level documented is 42 dB(A) at L1. The expected site emissions to the north, as typified by modeling locations

L5, L10, L11, L16, and L17, are in the range of 30-to-34 dB(A). As such, the future minimum levels will be in the 42-to-43 dB(A) range, a change of 0-to-1 dB. This puts the situation in the lowest category of impact, "under 5" dB, given in Table B of the NYSDEC Program Policy. Essentially, there is no impact. As the policy points out, increasing the ambient by 0-to-3 dB should have no appreciable effect on receptors.

- To the east, the lowest ambient A-weighted sound level documented is 29 dB(A) at L2. Site emissions to the east at L6 and L12 are in the 28-to-29 dB(A) range. Minimum levels at these locations may increase by 3 dB to 32 dB(A). Once again, the impact is in the lowest range given in the NYSDEC Program Policy.

- Southern emissions at L7 and L13 are projected to be in the range of 30-to-32 dB(A). Comparing these levels to the lowest ambient level obtained near the stream at L3, 42 dB(A), minimum levels will remain at 42 dB(A). Essentially there is no change in level and no impact.

- To the west, the minimum level observed is 38 dB(A). Future noise contributed by the site at L8, L9, L14, and L15 is in the 32-to-36 dB(A) range, such that the minimum level may increase by 1-to-2 dB(A).

In summary, the maximum increase in the minimum level in any direction is 3 decibels which indicates an "unnoticed" situation per the NYSDEC Program Policy guidelines.

4. Note that the county code calls for the L_{10} emissions at night to not exceed 55 dB(A). The site noise is nominally steady in nature, that is the site emissions have $L_{90}=L_{50}=L_{10}$ and are projected (with mitigation) to be in the 28-to-35 dB(A) range at the property lines and homes. Hence, there is a wide margin of compliance with the requirement that L_{10} not exceed 55 dB(A).

5. The reviewer asked for detailed results in octave bands. Four charts are provided in Attachment B that allow drawing conclusions about the impact in octave bands in each of the four compass directions. Each chart shows the site modeled sound emissions

compared with the Clarkstown Night Code octave band limits and the prevailing octave band ambient. The results show that projected emissions are generally below both the Code and prevailing ambient and will have little to no impact on the surroundings.

CONCLUSION

Our analysis finds that the projected site sound emissions with mitigation, shown in Figure 3 of Attachment A, will result in minimal acoustical impact and full compliance with all applicable regulations.

❑ ❑ ❑ ❑

I trust that this supplemental information will be found responsive to the reviewer's concerns and look forward to answering any questions.

Sincerely yours,

OSTERGAARD ACOUSTICAL ASSOCIATES

Benjamin C. Mueller, P.E.
Principal

EMC:amc

Enclosures: Attachment A: 12 April 2010 Letter
Attachment B: Four octave band graphs

Reference 1: "Electric Power Plant Environmental Noise Guide", 2nd Editiion, Edison Electric Institute, 1984.

ATTACHMENT A

OSTERGAARD
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12 April 2010

Ms. Joanne Lanza, Electrical Engineer
Transmission & Substation Engineering
Orange and Rockland Utilities, Inc.
390 West Route 59
Spring Valley, NY 10977

Re: Gas Regulator Noise Mitigation
Little Tor Substation, Clarkstown, New York
OAA File 3599B

Dear Ms. Lanza:

As requested, we have evaluated noise control options to bring the gas regulator stations into compliance with the local and county noise code. The site currently contains a gas regulator station in the northeast corner of the site. Plans call for a new electric substation and relocating and reconfiguring the regulators to two separate stations, a worker station and a monitor station. The worker station will be moved to the northernmost station nearer to South Mountain Road. The monitor station will be 50 feet south of the worker station. The site and equipment locations are shown in Figure 1, based on aerials obtained from Google Earth.

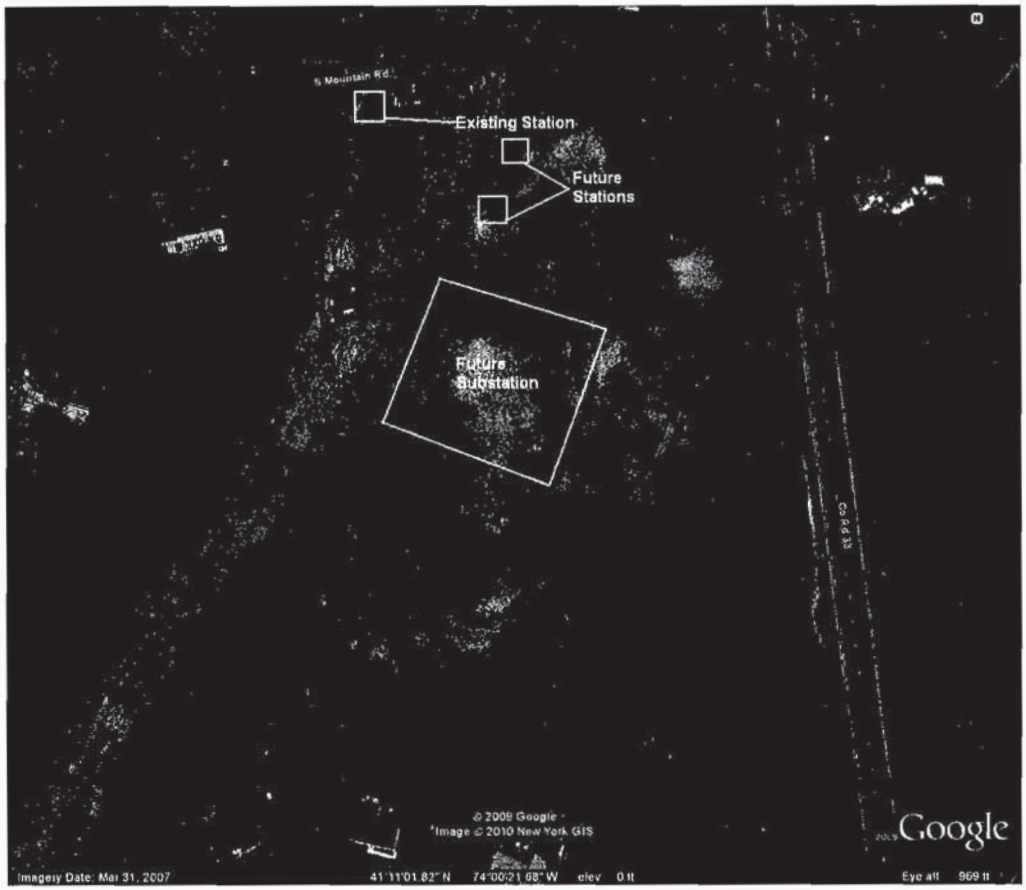


Figure 1 — Site and vicinity with existing and future equipment locations shown.

The details and results of our acoustical impact analysis of the existing and proposed site plans were given in our 1 February 2010 report. Our findings showed that the existing gas regulator station exceeds both county and local noise codes at the nearest property line. Calculations show that the proposed regulators in the new locations, while farther from the property line, will still exceed the local noise code of 46 dB(A). Mitigation is needed to bring the gas regulator stations into compliance.

Two gas pressure conditions are accommodated, high inlet and low inlet, which affect the noise produced by the regulators. The low inlet condition results in higher sound contributions at the north property line and is the focus of our noise control efforts. Figure 2 is taken from our 1 February report and shows the future sound emissions with gas regulators under low inlet pressure, without noise control.

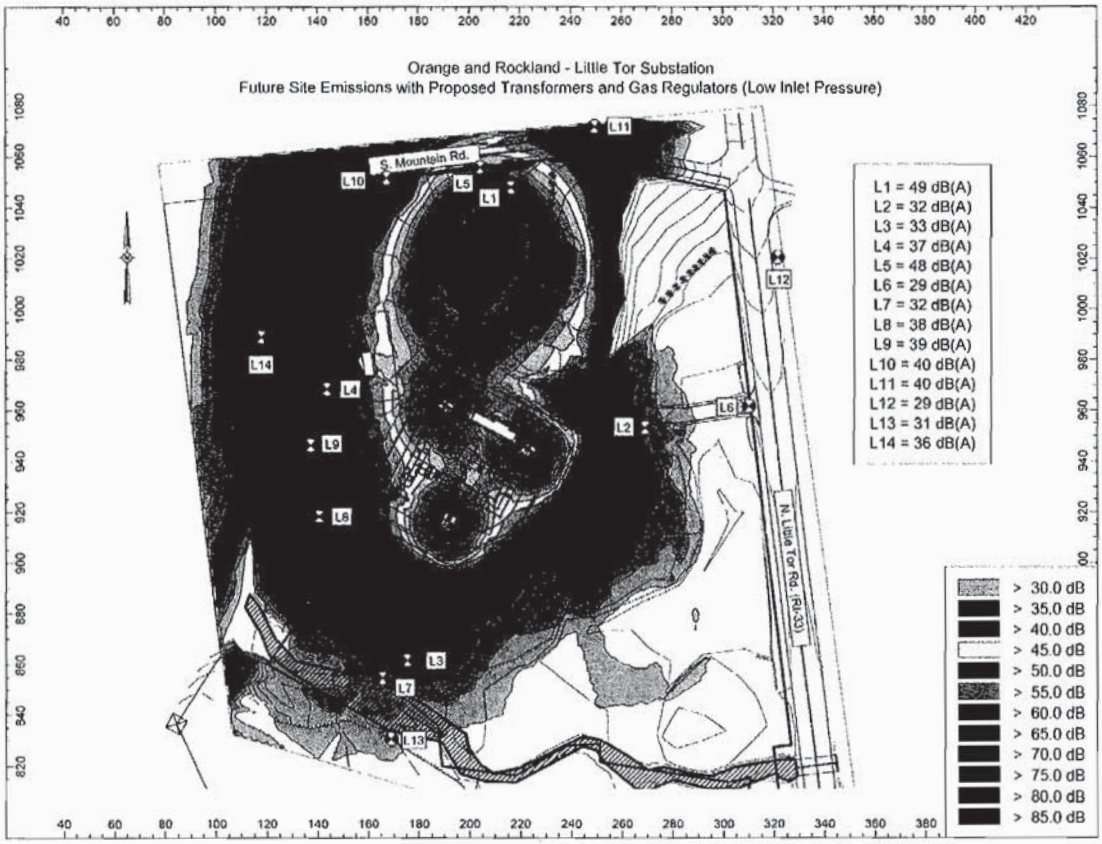


Figure 2 — A-weighted sound emission contours 5 feet above grade at Orange and Rockland Little Tor site. Proposed transformers and gas regulator stations operating under low inlet pressure condition.

APPLICABLE REGULATIONS

The local noise code of Clarkstown, New York is given in Chapter 205 Noise, and Chapter 290-13, Performance Standards. Chapter 205 is a nuisance noise ordinance and does not include quantitative noise limits. For a residential district, Chapter 290-13 specifies a nighttime noise limit of 46 dB(A) from 2200 hours to 0700 hours measured 25 feet from the principal on-site building. Because there is no principal building on site, we used the 46 dB(A) limit at the substation property line. This limit is reduced to 41 dB(A) for noises of periodic character such as a hum. There are also limits in octave frequency bands.

Article IX of the Rockland County Sanitary Code also provides noise limits in section 9.8.2. This section limits noise produced at a residential property line to a maximum sound pressure level of 65 dB(A), or L_{10} of 60 dB(A), during the day, from 0700 hours to 2200 hours. This limit is reduced to a maximum sound level of 55 dB(A), or L_{10} of 50 dB(A), at night, from 2200 hours to 0700 hours.

The State of New York has not implemented a state-wide noise code.

MITIGATION

Where there is insufficient distance for equipment sound emissions to meet codes, mitigation needs to be investigated and implemented. Sometimes it is possible to procure quieter equipment. For this application, I understand that equipment has already been purchased, so that the only option for mitigation is to interpose screening between the noise sources and receptor locations where code limits need to be met. The screening is customarily in the form of acoustical barriers.

To be effective, acoustical barriers need to have the following characteristics:

- Sufficient sound transmission loss so that sound reaching the other side is forced to travel over, not through, the barrier panel.

- A sound absorptive surface facing the noise source. This is important in suppressing reflections to other areas and reducing the build-up of sound between the noise source and barrier.

- Tall and long enough so that sufficient shadowing of sound is achieved at receptor vantage points.

Note that all three of the above barrier characteristics are a function of frequency. Higher frequencies, like those produced by the regulators, are easier to block and absorb, whereas lower frequencies are more difficult to control. The gas regulators produce the highest levels in the 2000 Hz and 4000 Hz octave bands.

In addition to acoustical considerations, barrier placement needs to be sensitive to clearance requirements established by Orange and Rockland for access and maintenance of equipment. To accommodate this, the barrier should be located in place of, or outside of, the proposed fence surrounding the regulators.

Manufacturer's sound data were used in the acoustical model to simulate the worst-case low inlet pressure flow condition, which results in the highest noise level. Normal operating flow conditions will produce lower sound levels.

There are many possible configurations for barriers that can successfully mitigate conditions. The objective is to minimize the extent of barrier to minimize costs. Figure 3 shows a barrier configuration that introduces an 8-foot U-shaped length of barrier around each regulator station with the regulators operating at the worst-case low inlet pressure. The concept is to shield the property line from the noise source. The results show that in addition to being below the nighttime noise code limit of 46 dB(A), there is compliance in all octave band frequencies including at 2000 and 4000 Hz.

Each barrier should be carried 8 feet above grade and follow the outline of the proposed security fences, nominally 15′ x 20′ in plan. For both stations, the south segment is 15 feet and the west segment is 20 feet in length. The barrier for the north Worker Regulator station has a longer north segment, which is 20 feet in plan. The north segment of the Monitor Regulator station is 15 feet.

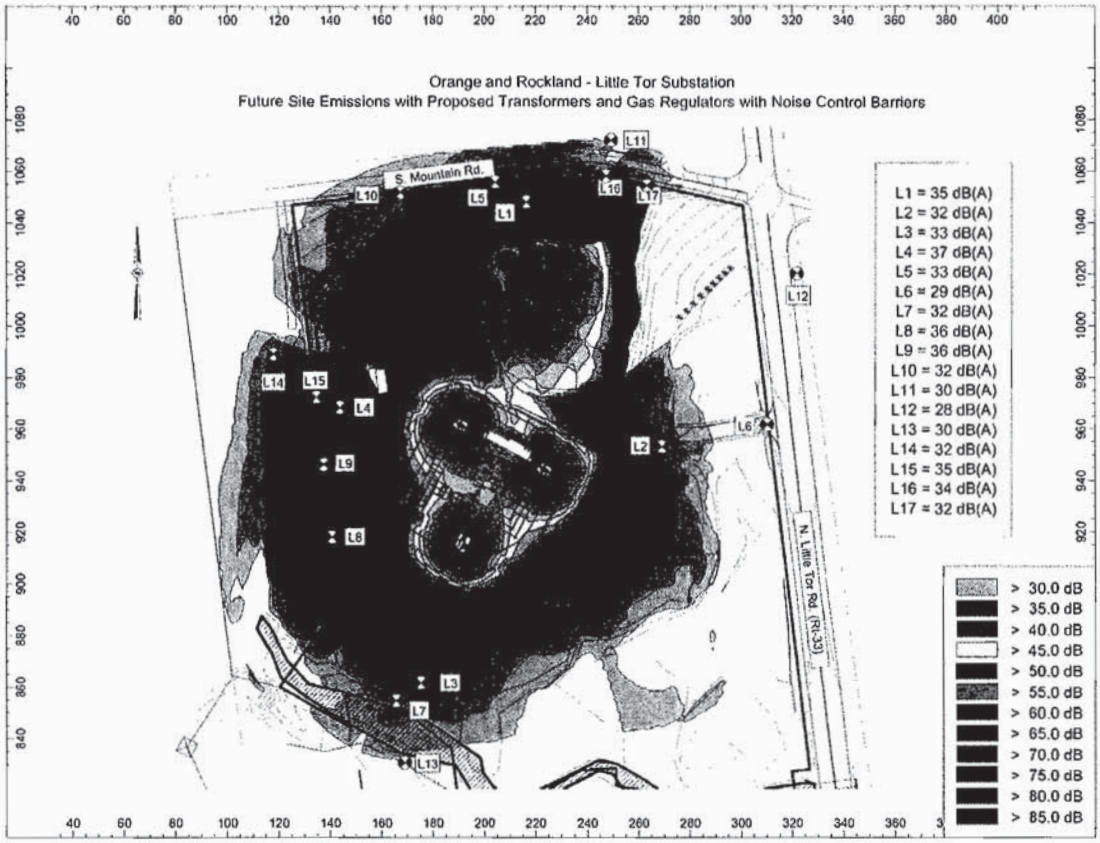


Figure 3 — A-weighted sound emission contours 5 feet above grade at Orange and Rockland Little Tor site. Future conditions with substation and gas regulators under worst-case low inlet pressure with U-shaped barriers shown in light blue.

BARRIER IMPLEMENTATION

The important acoustical characteristics for acceptable noise control barriers, in addition to the minimum height of 8 feet and the 3-sided layout shown in Figure 3, are as follows:

- The barrier needs to force sound to go over the panel, not leak through it. Therefore acceptable barrier materials need to be solid and have a minimum surface weight of 4 lbs/ft^2 for this application.

- The barrier needs to seal well to the ground so that sound does not leak under the barrier.

- A sound absorptive inner face, facing the regulators, is necessary for this application.

Hence, acceptable barriers can be constructed using precast or cast-in-place concrete lined with sound absorptive material such as 3-inch thick M-90 panels by Empire Acoustical Systems. Also acceptable are acoustical metal panels from manufacturers such as Aeroacoustic or Industrial Acoustics (IAC), or special systems such as the Sound Fighter LSE System from Noise Abatement Technologies. Because the noise reduction demands are not stringent, a good fit for this project are non-metallic (PVC) acoustical barriers. The ArtUSA Silent Protector Barrier has the aesthetics of a PVC fence on the exterior but has acoustical fill and a perforated interior.

The attached acoustical specification summarizes the required important characteristics for manufactured barrier products. A convenient means to seal to the ground is to bring the barrier panels in contact with existing or new gravel and infill any gaps from both sides of the panel with pea gravel.

The barrier needs to accommodate access to the equipment for both occasional inspection or more complex maintenance operations. Orange and Rockland needs to clarify access requirement and oversee placement of acoustical compatible man-doors or larger access panels. Ostergaard Acoustical Associates is prepared to work with Orange and Rockland and the chosen supplier to insure that access meets both acoustical and operational needs.

Regardless of which manufactured barrier product is under consideration by Orange and Rockland, Ostergaard Acoustical Associates should be asked to review product submittals before the project is released for construction.

Ostergaard Acoustical Associates should also be asked to review bid documents and Orange and Rockland's drawings, prior to release for pricing, to insure correct interpretation of our recommendations and to allow updating of our acoustical model. Structural and other non-acoustical aspects of the installation need to be overseen by qualified professionals at Orange and Rockland.

❑ ❑ ❑ ❑

I trust the above is useful to you and look forward to answering any questions you might have.

Sincerely yours,

OSTERGAARD ACOUSTICAL ASSOCIATES

Benjamin C. Mueller, P.E.
Senior Engineer

BCM:amc

Enclosure

ACOUSTICAL SPECIFICATION

ACOUSTICAL BARRIER FOR SCREENING GAS REGULATORS
ORANGE AND ROCKLAND LITTLE TOR SUBSTATION, CLARKSTOWN, NEW YORK

An acoustical barrier is needed to reduce the noise radiated to the community from two gas regulator stations associated with the site. The acoustical panels shall be 2¾-to-6-inch thick standard panels with one solid panel face and one sound-absorptive face comprising perforated panel over glass fiber insulation.

Sound Transmission Loss

The panel shall, at a minimum, have the following sound transmission loss when tested in accordance with ASTM Test Method E 90:

1/3 Octave Band Center Frequency (Hz)	***125***	***250***	***500***	***1000***	***2000***	***4000***
Minimum Transmission Loss (dB)	*16*	*20*	*26*	*35*	*35*	*29*

Sound Absorption

The perforated face of the panel shall, at a minimum, have the following sound absorption coefficients when tested in accordance with ASTM Test Method C 423:

1/3 Octave Band Center Frequency (Hz)	***125***	***250***	***500***	***1000***	***2000***	***4000***
Minimum Absorption Coefficient	*.40*	*.80*	*.85*	*.85*	*.80*	*.70*

Construction

The barrier shall be fabricated to withstand exterior conditions. The acoustical insulation shall be water resistant glass fiber. A thin (3 mil maximum) plastic or mylar layer may be used to protect the insulation provided that absorption requirements are met.

Installation

The sound absorptive face shall be oriented toward the noise source.

Products Expected to Meet These Requirements

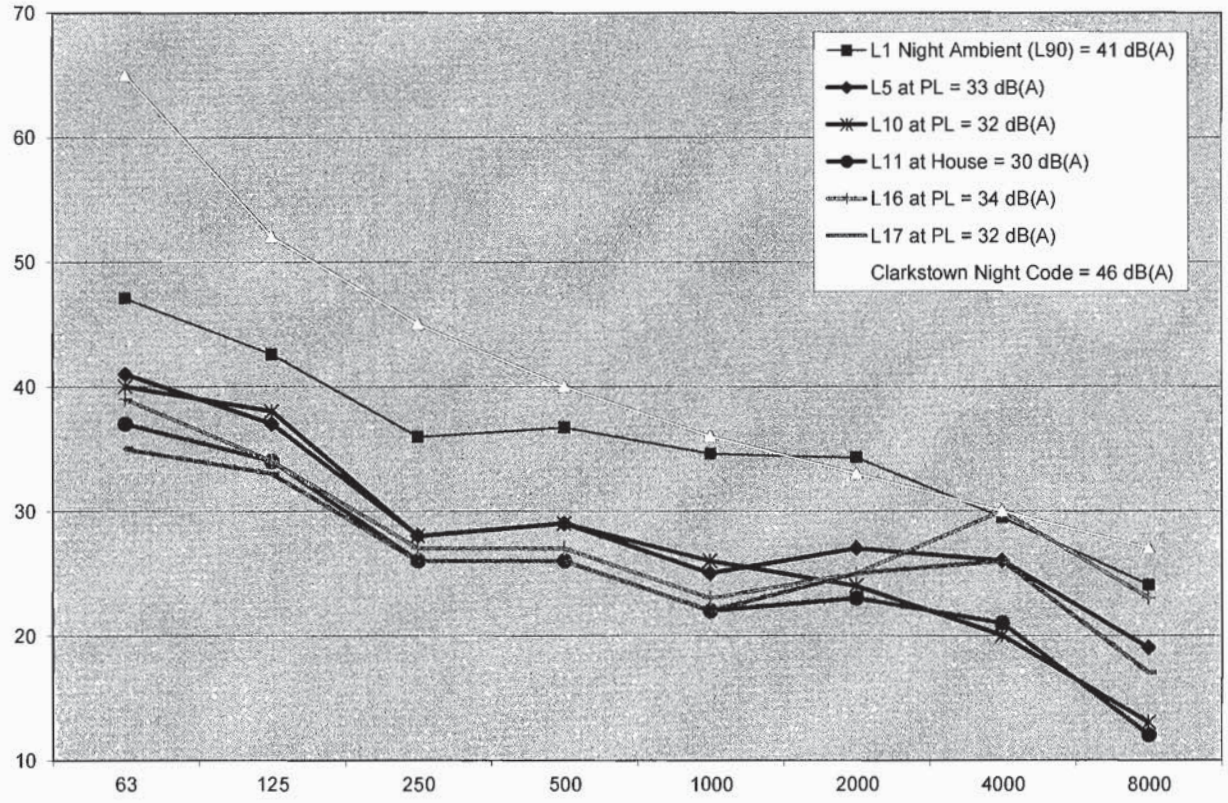
Model LSE noise barrier wall system by Noise Abatement Technologies
Model 4P Silentbarrier panels by Aeroacoustic.
3-inch thick Silent Screen panels from Empire Acoustical Systems
Model FSt/S panels by Industrial Acoustics Co.
STC-31 Silent Protector Absorbent Wall by ArtUSA

Manufacturers

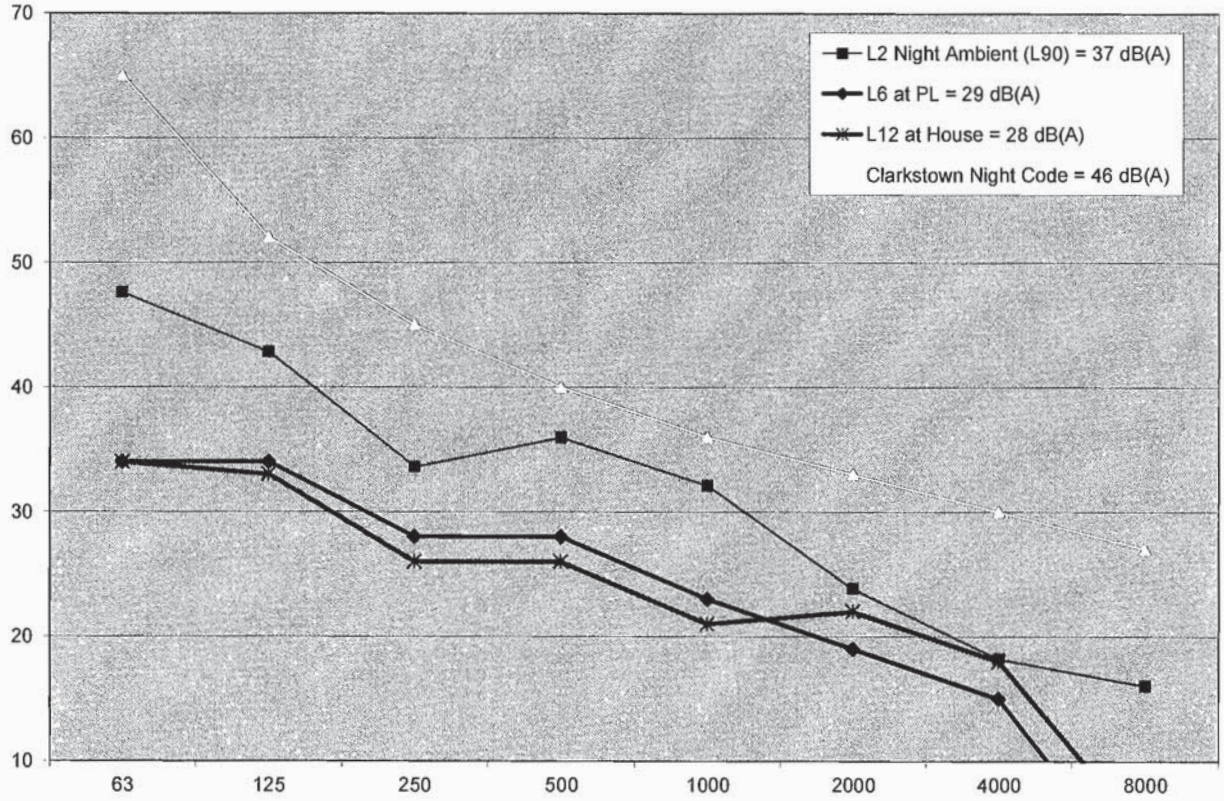
Noise Abatement Technologies, Edison, New Jersey, (732) 287-2755.
The Aeroacoustic Corporation, Roselle, New Jersey, (800) 842-2376.
Empire Acoustical Systems, Gatesville, Texas, (254) 404-9000
Industrial Acoustics Co., Bronx, New York, (718) 931-8000
ArtUSA, Atlanta, Georgia, (770) 246-7827

ATTACHMENT B

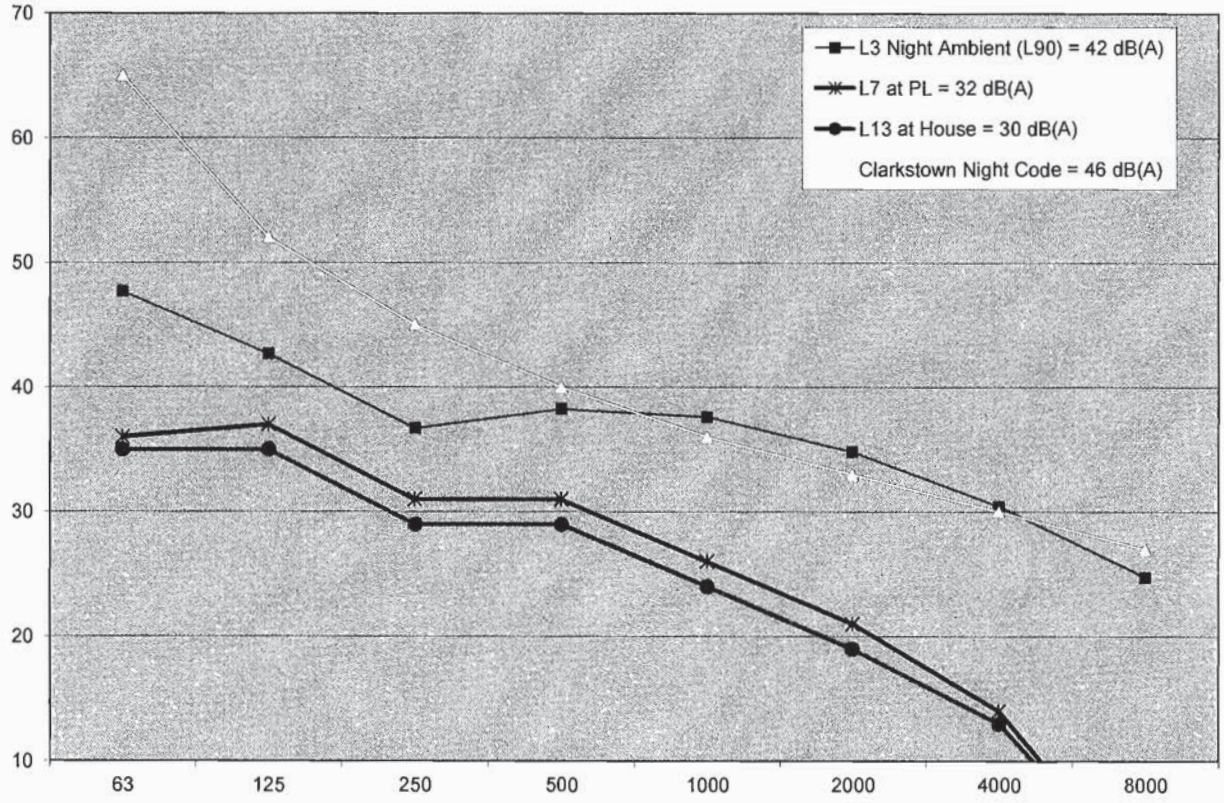
Little Tor Substation
Acoustical Impact to the North

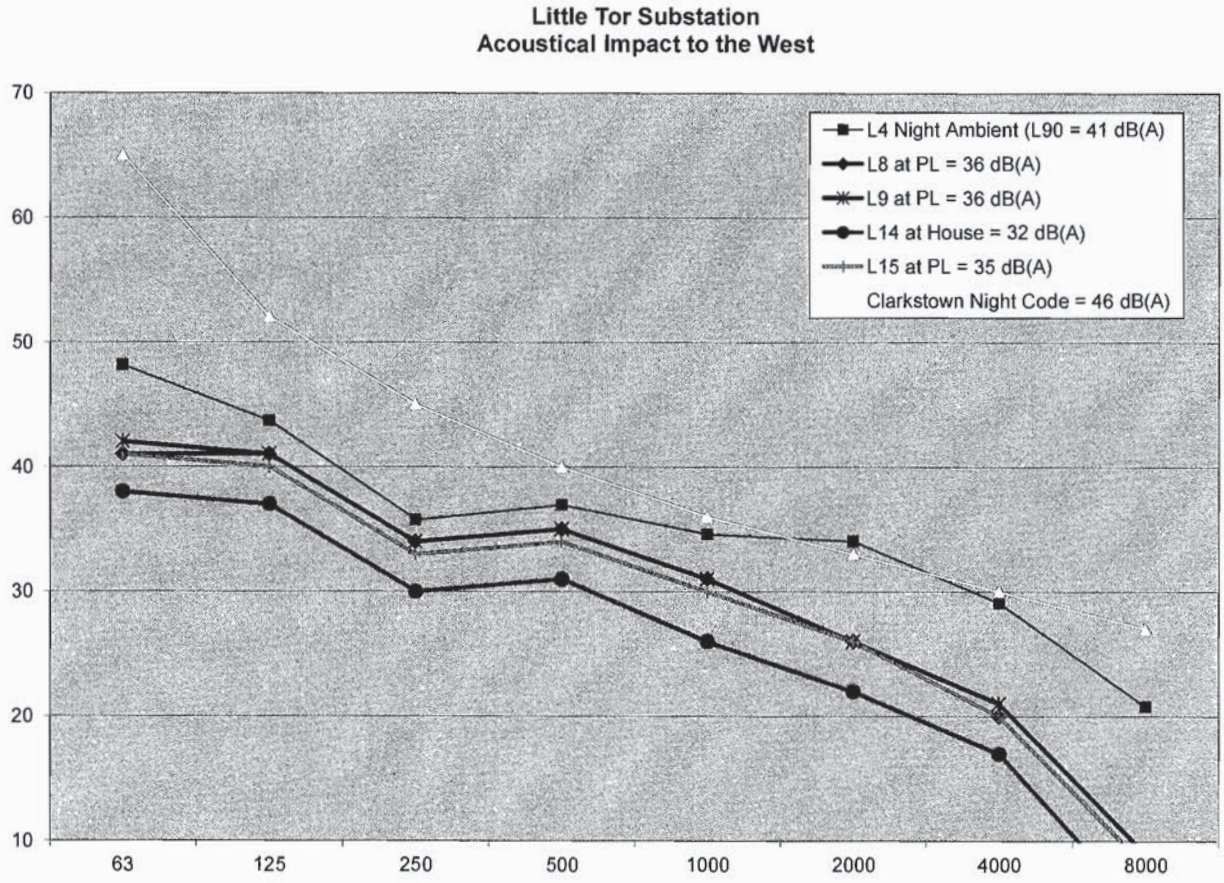


Little Tor Substation
Acoustical Impact to the East



Little Tor Substation
Acoustical Impact to the South




Little Tor Substation
Acoustical Impact to the West
70
60
50
40
30
20
10
63
125
250
500
1000
2000
4000
8000
L4 Night Ambient (L90 = 41 dB(A)
L8 at PL = 36 dB(A)
L9 at PL = 36 dB(A)
L14 at House = 32 dB(A)
L15 at PL = 35 dB(A)
Clarkstown Night Code = 46 dB(A)

POTENTA Environmental Consultants, LLC.
Engineers, Environmental Specialists

December 20, 2011

Ms. Shirley Thormann
Chairwoman-Planning Board
Town of Clarkstown
10 Maple Avenue
New City, New York 10956

RE: Comments on DEIS/Acoustical Impact Study
- Orange and Rockland Utilities, Inc.
Proposed Little Tor Substation Project
Town of Clarkstown, Rockland County, N.Y.
PEC Project No. 11570

Dear Ms. Thormann:

This letter report provides our summary review of the supplemental noise data provided by Ostergaard Acoustical Associates in their letter dated October 7, 2011, in response to our September 15, 2011 comment letter regarding the SEQRA DEIS and the potential noise impacts of the proposed substation project to be located in the Town of Clarkstown, New York.

The additional information provided included data concerning the technical mitigation analysis for the screening of the proposed gas regulators onsite from the near property lines and adjacent residential receptors, comparison of the projected impact on noise levels versus the local standards including the octave band noise levels, and an evaluation of the potential noise impacts versus ambient noise levels in accordance with the NYSDEC Program Policy for Assessing and Mitigating Noise Impacts (DEP-00-1, Feb. 2, 2001) under SEQRA regulations.

Mitigation Analysis Report

The mitigation study shows that the recommended U-shaped sound barriers surrounding the proposed gas regulators included with the project provides for adequate mitigation of the equipment noise levels to result in compliance of the site generated noise with the local octave band noise standards and the Rockland County noise standards at the site property lines and adjacent residences. The octave band noise level data provided in Attachment B Figures in the October 7, 2011 response letter clearly shows project compliance with the local noise ordinance with the proposed sound barrier mitigation in place. The data also shows compliance with the 41dBA sound level lowered 5dBA from the 46dBA local standard for the noted tonal character of the noise produced by the proposed equipment sources onsite.

Project Noise Impact versus Ambient Levels

In accordance with the NYSDEC program policy, the Figures in Attachment B of the October 7, 2011 response letter also provide a comparison of the projected noise levels versus the measured ambient noise. However, ambient noise levels for comparison with site generated noise impact levels should be free of influence from existing site equipment sources. Despite the

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fact stated in the DEIS documents that the minimum ambient nighttime noise levels at the near receptors along the North property line included effects of the existing gas regulator equipment onsite, the projected site generated noise levels with mitigation are shown to comply with the local noise code and are lower than both the nighttime ambient octave band and 41dBA noise levels recorded at the near receptor at Site L1. Based on the supplemental information submitted for review, it can be assumed that the nearby East property line receptor L2 (remote to the gas regulators) with a nighttime ambient noise level of 37dBA is free of influence from the existing site equipment noise (as shown in Figure 19, Appendix C-DEIS) and is more representative of the true ambient noise level near the North property line receptors. For that scenario, comparing the worst-case noise impact of the projected equipment noise level of 34dBA (with mitigation) at Site L16 on the North property line with the assumed 37dBA nighttime ambient noise level would result in less than a 3dBA increase in ambient noise at Site L16 described as "unnoticed or tolerable" noise impact, under 5dBA, referenced in Table B of the NYSDEC Program Policy.

Due to several factors including the complex site terrain, the equipment noise modelling procedures, and the need for sound barrier attenuation of the proposed equipment noise, it is recommended that the Town consider requiring the monitoring of project-generated site noise at the critical receptors to the North and West of the site as a condition of approval and issuance of a certificate of occupancy for the project site. The independent sound test should be performed after installation of the proposed equipment and recommended acoustical barriers is completed to ensure that the attenuated site noise levels will result in compliance with the local noise code and to verify the ambient noise assessment conclusions regarding the NYSDEC Program Policy.

DEIS Report

The DEIS text summarizes the conclusions of the project noise assessment and technical noise report included in Appendix C. The Town may wish to include revisions to the DEIS text and the technical noise report, as necessary, clarifying the results and conclusions of the project impact on ambient noise levels set forth in the NYSDEC Program Policy and compliance with the local noise code based on the responses reflected in the supplemental information submitted.

If you have any questions regarding the above review comments, please do not hesitate to contact me.

Very truly yours,
POTENTA Environmental Consultants, L.L.C.

Edward J. Potenta, Principal
Institute of Noise Control Engineering-Member

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10 January 2012

Ms. Joanne Lanza
Transmission & Substation Engineering
Orange & Rockland Utilities, Inc.
390 W Route 59
Spring Valley, NY 10977

Re: Little Tor Substation Project, Clarkstown, New York
Review of 20 December Letter from Potenta Consultants
OAA File 3599A

Dear Ms. Lanza:

As requested, we have reviewed the 20 December comment letter by Potenta Environmental Consultants, LLC concerning our sound emission analyses of the Little Tor Substation Project. Our reading of the letter indicates that the reviewer finds our analyses to provide sufficient evidence that sound emissions will be acceptable, both in terms of impact upon prevailing ambient noise levels and meeting of absolute limits given in applicable codes. Hence there appears to be no outstanding acoustical issues to resolve.

The reviewer suggests testing of sound emissions at receptors to the north and west of the site prior to issuance of a C.O. If the board chooses to implement such a requirement, Ostergaard Acoustical Associates has been authorized by Orange and Rockland to conduct additional testing once the substation is put in service to confirm acoustical emissions meet County and Town standards.

❑ ❑ ❑ ❑

I trust that the above is helpful and I look forward to answering any questions you may have.

Sincerely yours,

OSTERGAARD ACOUSTICAL ASSOCIATES

Benjamin C. Mueller, P.E.
Principal

EMC:amc

APPENDIX G-
EMF Rapid Report

June 2002

EMF

Electric and Magnetic Fields Associated with the Use of Electric Power

Questions & Answers

prepared by the
National Institute of Environmental Health Sciences
National Institutes of Health

EMF RAPID
Electric and Magnetic Fields Research and Public Information Dissemination Program

sponsored by the
NIEHS/DOE EMF RAPID Program

Contents

Introduction 2

1 **EMF Basics** 4

Reviews basic terms about electric and magnetic fields.

2 **Evaluating Potential Health Effects** 10

Explains how scientific studies are conducted and evaluated to assess possible health effects.

3 **Results of EMF Research** 16

Summarizes results of EMF-related research including epidemiological, clinical, and laboratory studies.

4 **Your EMF Environment** 28

Discusses typical magnetic exposures in homes and workplaces and identifies common EMF sources.

5 **EMF Exposure Standards** 46

Describes standards and guidelines established by state, national, and international safety organizations for some EMF sources and exposures.

6 **National and International EMF Reviews** 50

Presents the findings and recommendations of major EMF research reviews including the EMF RAPID Program.

7 **References** 58

Selected references on EMF topics.

Introduction

Since the mid-twentieth century, electricity has been an essential part of our lives. Electricity powers our appliances, office equipment, and countless other devices that we use to make life safer, easier, and more interesting. Use of electric power is something we take for granted. However, some have wondered whether the electric and magnetic fields (EMF) produced through the generation, transmission, and use of electric power [power-frequency EMF, 50 or 60 hertz (Hz)] might adversely affect our health. Numerous research studies and scientific reviews have been conducted to address this question.

Unfortunately, initial studies of the health effects of EMF did not provide straightforward answers. The study of the possible health effects of EMF has been particularly complex and results have been reviewed by expert scientific panels in the United States and other countries. This booklet summarizes the results of these reviews. Although questions remain about the possibility of health effects related to EMF, recent reviews have substantially reduced the level of concern.

The largest evaluation to date was led by two U.S. government institutions, the National Institute of Environmental Health Sciences (NIEHS) of the National Institutes of Health and the Department of Energy (DOE), with input from a wide range of public and private agencies. This evaluation, known as the Electric and Magnetic Fields Research and Public Information Dissemination (EMF RAPID) Program, was a six-year project with the goal of providing scientific evidence to determine whether exposure to power-frequency EMF involves a potential risk to human health.

In 1999, at the conclusion of the EMF RAPID Program, the NIEHS reported to the U.S. Congress that the overall scientific evidence for human health risk from EMF exposure is weak. No consistent pattern of biological effects from exposure to EMF had emerged from laboratory studies with animals or with cells. However, epidemiological studies (studies of disease incidence in human populations) had shown a fairly consistent pattern that associated potential EMF exposure with a small increased risk for leukemia in children and chronic lymphocytic leukemia in adults. Since 1999, several other assessments have been completed that support an association between childhood leukemia and exposure to power-frequency EMF. These more recent reviews, however, do not support a link between EMF exposures and adult leukemias. For both childhood and adult leukemias, interpretation of the epidemiological findings has been difficult due to the absence of supporting laboratory evidence or a scientific explanation linking EMF exposures with leukemia.

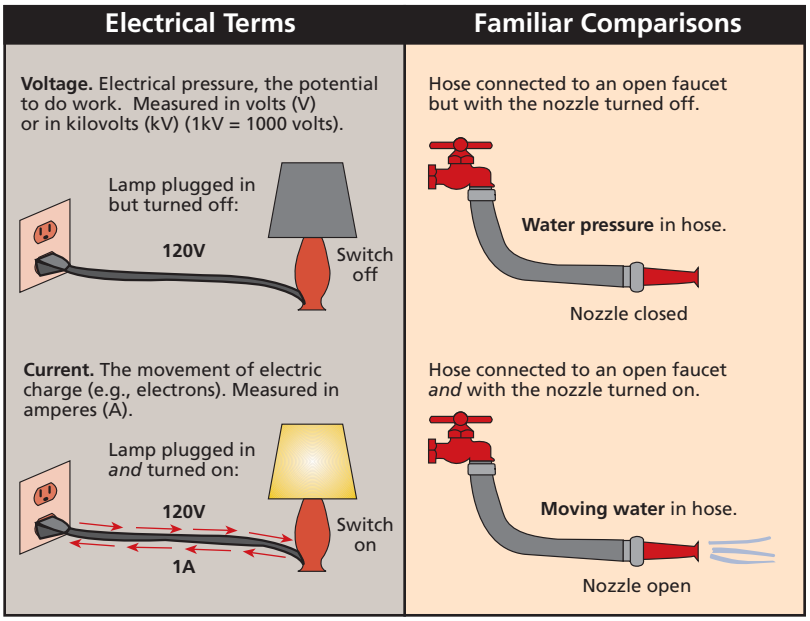
EMF exposures are complex and exist in the home and workplace as a result of all types of electrical equipment and building wiring as well as a result of nearby power lines. This booklet explains the basic principles of electric and magnetic fields, provides an overview of the results of major research studies, and summarizes conclusions of the expert review panels to help you reach your own conclusions about EMF-related health concerns.

1 EMF Basics

This chapter reviews terms you need to know to have a basic understanding of electric and magnetic fields (EMF), compares EMF with other forms of electromagnetic energy, and briefly discusses how such fields may affect us.

Q What are electric and magnetic fields?

A Electric and magnetic fields (EMF) are invisible lines of force that surround any electrical device. Power lines, electrical wiring, and electrical equipment all produce EMF. There are many other sources of EMF as well (see pages 33–35). The focus of this booklet is on power-frequency EMF—that is, EMF associated with the generation, transmission, and use of electric power.



Voltage produces an electric field and current produces a magnetic field.

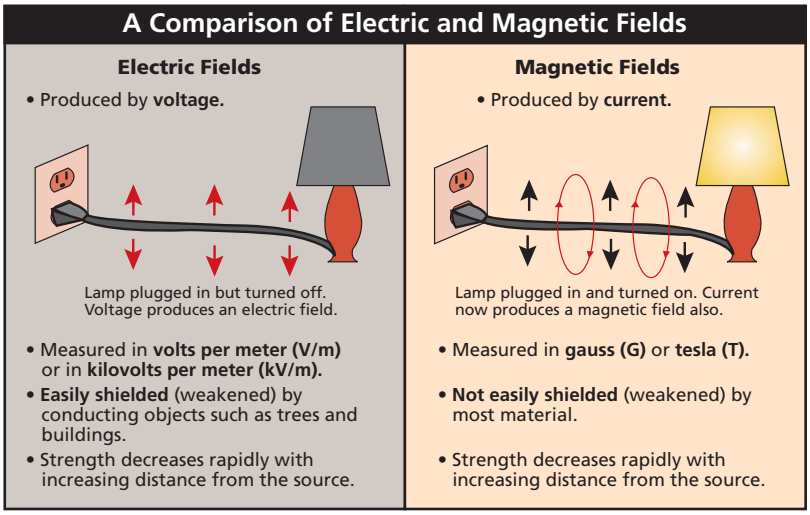
Electric fields are produced by voltage and increase in strength as the voltage increases. The electric field strength is measured in units of volts per meter (V/m). Magnetic fields result from the flow of current through wires or electrical devices and increase in strength as the current increases. Magnetic fields are measured in units of gauss (G) or tesla (T).

Most electrical equipment has to be turned on, i.e., current must be flowing, for a magnetic field to be produced. Electric fields are often present even when the equipment is switched off, as long as it remains connected to the source of electric power. Brief bursts

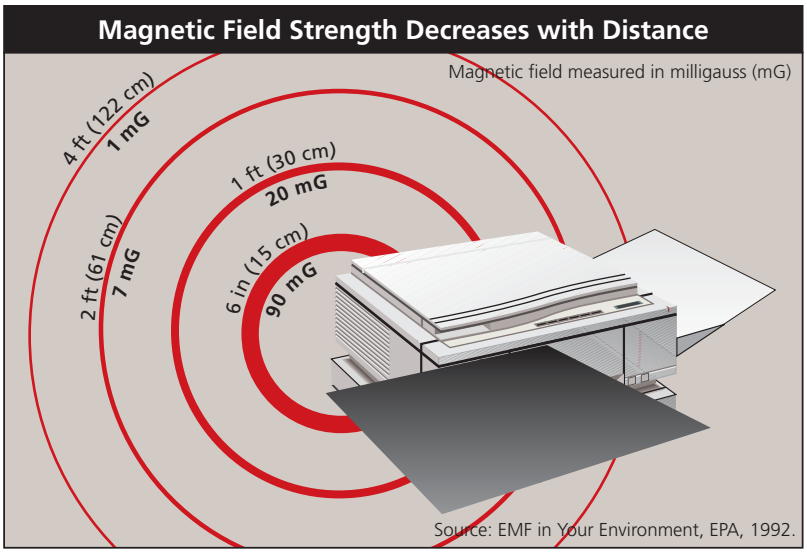
of EMF (sometimes called "transients") can also occur when electrical devices are turned on or off.

Electric fields are shielded or weakened by materials that conduct electricity—even materials that conduct poorly, including trees, buildings, and human skin. Magnetic fields, however, pass through most materials and are therefore more difficult to shield. Both electric fields and magnetic fields decrease rapidly as the distance from the source increases.

Even though electrical equipment, appliances, and power lines produce both electric and magnetic fields, most recent research has focused on potential health effects of magnetic field exposure. This is because some epidemiological studies have reported an increased cancer risk associated with estimates of magnetic field exposure (see pages 19 and 20 for a summary of these studies). No similar associations have been reported for electric fields; many of the studies examining biological effects of electric fields were essentially negative.



An appliance that is plugged in and therefore connected to a source of electricity has an electric field even when the appliance is turned off. To produce a magnetic field, the appliance must be plugged in and turned on so that the current is flowing.



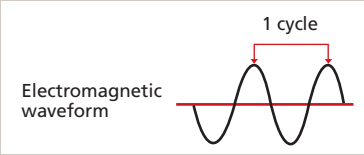
You cannot see a magnetic field, but this illustration represents how the strength of the magnetic field can diminish just 1–2 feet (30–61 centimeters) from the source. This magnetic field is a 60-Hz power-frequency field.

Characteristics of electric and magnetic fields

Electric fields and magnetic fields can be characterized by their wavelength, frequency, and amplitude (strength). The graphic below shows the waveform of an alternating electric or magnetic field. The direction of the field alternates from one polarity to the opposite and back to the first polarity in a period of time called one cycle. Wavelength describes the distance between a peak on the wave and the next peak of the same polarity. The frequency of the field, measured in hertz (Hz), describes the number of cycles that occur in one second. Electricity in North America alternates through 60 cycles per second, or 60 Hz. In many other parts of the world, the frequency of electric power is 50 Hz.

Frequency and Wavelength

Frequency is measured in hertz (Hz).
1 Hz = 1 cycle per second.



Examples:

Source	Frequency	Wavelength
Power line (North America)	60 Hz	3100 miles (5000 km)
Power line (Europe and most other locations)	50 Hz	3750 miles (6000 km)

Q How is the term EMF used in this booklet?

A The term "EMF" usually refers to electric and magnetic fields at extremely low frequencies such as those associated with the use of electric power. The term EMF can be used in a much broader sense as well, encompassing electromagnetic fields with low or high frequencies (see page 8).

Measuring EMF: Common Terms

Electric fields

Electric field strength is measured in volts per meter (V/m) or in kilovolts per meter (kV/m). 1 kV = 1000 V

Magnetic fields

Magnetic fields are measured in units of gauss (G) or tesla (T). Gauss is the unit most commonly used in the United States. Tesla is the internationally accepted scientific term. 1 T = 10,000 G

Since most environmental EMF exposures involve magnetic fields that are only a fraction of a tesla or a gauss, these are commonly measured in units of microtesla (μT) or milligauss (mG). A milligauss is 1/1,000 of a gauss. A microtesla is 1/1,000,000 of a tesla. 1 G = 1,000 mG; 1 T = 1,000,000 μT

To convert a measurement from microtesla (μT) to milligauss (mG), multiply by 10.
1 μT = 10 mG; 0.1 μT = 1 mG

When we use EMF in this booklet, we mean extremely low frequency (ELF) electric and magnetic fields, ranging from 3 to 3,000 Hz (see page 8). This range includes power-frequency (50 or 60 Hz) fields. In the ELF range, electric and magnetic fields are not coupled or interrelated in the same way that they are at higher frequencies. So, it is more useful to refer to them as "electric and magnetic fields" rather than "electromagnetic fields." In the popular press, however, you will see both terms used, abbreviated as EMF.

This booklet focuses on extremely low frequency EMF, primarily power-frequency fields of 50 or 60 Hz, produced by the generation, transmission, and use of electricity.

Q How are power-frequency EMF different from other types of electromagnetic energy?

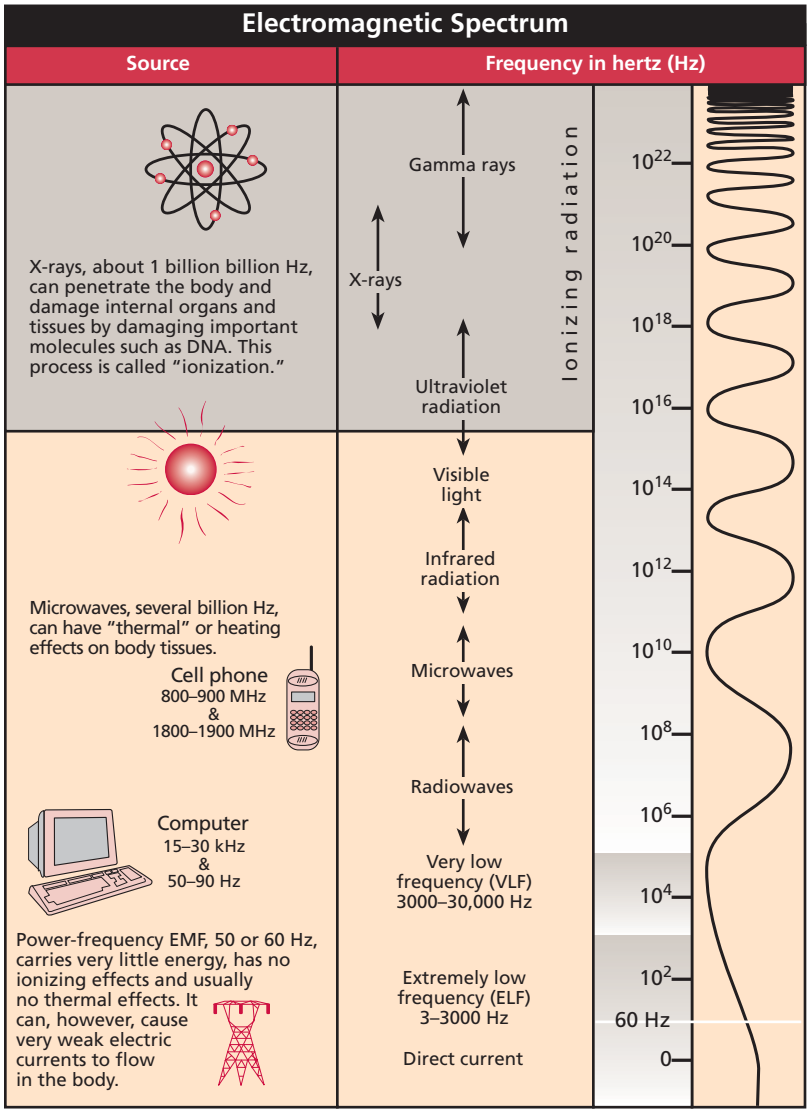
A X-rays, visible light, microwaves, radio waves, and EMF are all forms of electromagnetic energy. One property that distinguishes different forms of electromagnetic energy is the frequency, expressed in hertz (Hz). Power-frequency EMF, 50 or 60 Hz, carries very little energy, has no ionizing effects, and usually has no thermal effects (see page 8). Just as various chemicals affect our bodies in different ways, various forms of electromagnetic energy can have very different biological effects (see "Results of EMF Research" on page 16).

Some types of equipment or operations simultaneously produce electromagnetic energy of different frequencies. Welding operations, for example, can produce electromagnetic energy in the ultraviolet, visible, infrared, and radio-frequency ranges, in addition to power-frequency EMF. Microwave ovens produce 60-Hz fields of several hundred milligauss, but they also create microwave energy inside the oven that is at a much higher frequency (about 2.45 billion Hz). We are shielded from the higher frequency fields inside the oven by its casing, but we are not shielded from the 60-Hz fields.

Cellular telephones communicate by emitting high-frequency electric and magnetic fields similar to those used for radio and television broadcasts. These radio-frequency and microwave fields are quite different from the extremely low frequency EMF produced by power lines and most appliances.

Q How are alternating current sources of EMF different from direct current sources?

A Some equipment can run on either alternating current (AC) or direct current (DC). In most parts of the United States, if the equipment is plugged into a household wall socket, it is using AC electric current that reverses direction in the electrical wiring—or alternates—60 times per second, or at 60 hertz (Hz). If the equipment uses batteries, then electric current flows in one direction only. This



The wavy line at the right illustrates the concept that the higher the frequency, the more rapidly the field varies. The fields do not vary at 0 Hz (direct current) and vary trillions of times per second near the top of the spectrum. Note that 10^4 means 10 x 10 x 10 x 10 or 10,000 Hz. 1 kilohertz (kHz) = 1,000 Hz. 1 megahertz (MHz) = 1,000,000 Hz.

produces a "static" or stationary magnetic field, also called a direct current field. Some battery-operated equipment can produce time-varying magnetic fields as part of its normal operation.

Q What happens when I am exposed to EMF?

A In most practical situations, DC electric power does not induce electric currents in humans. Strong DC magnetic fields are present in some industrial environments, can induce significant currents when a person moves, and may be of concern for other reasons, such as potential effects on implanted medical devices (see page 47 for more information on pacemakers and other medical devices).

AC electric power produces electric and magnetic fields that create weak electric currents in humans. These are called "induced currents." Much of the research on how EMF may affect human health has focused on AC-induced currents.

Electric fields

A person standing directly under a high-voltage transmission line may feel a mild shock when touching something that conducts electricity. These sensations are caused by the strong electric fields from the high-voltage electricity in the lines. They occur only at close range because the electric fields rapidly become weaker as the distance from the line increases. Electric fields may be shielded and further weakened by buildings, trees, and other objects that conduct electricity.

Magnetic fields

Alternating magnetic fields produced by AC electricity can induce the flow of weak electric currents in the body. However, such currents are estimated to be smaller than the measured electric currents produced naturally by the brain, nerves, and heart.

Q Doesn't the earth produce EMF?

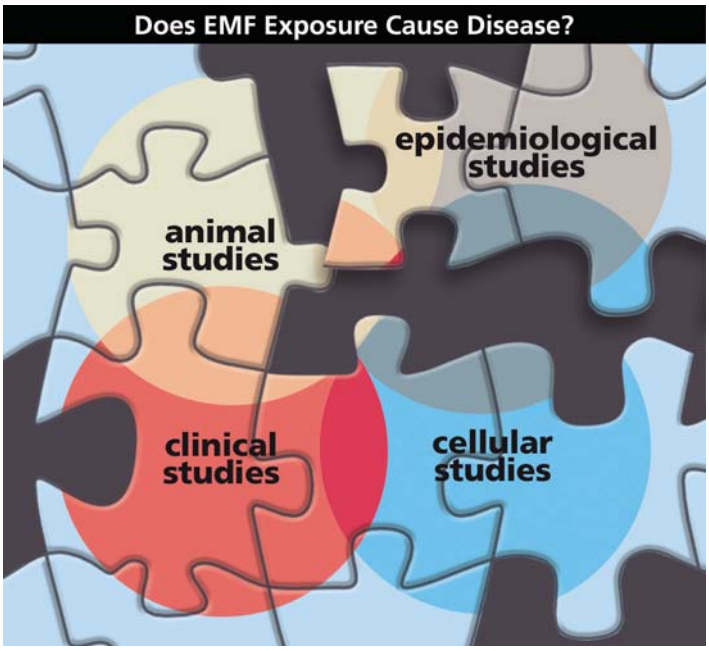
A Yes. The earth produces EMF, mainly in the form of static fields, similar to the fields generated by DC electricity. Electric fields are produced by air turbulence and other atmospheric activity. The earth's magnetic field of about 500 mG is thought to be produced by electric currents flowing deep within the earth's core. Because these fields are static rather than alternating, they do not induce currents in stationary objects as do fields associated with alternating current. Such static fields can induce currents in moving and rotating objects.

2 Evaluating Potential Health Effects

This chapter explains how scientific studies are conducted and evaluated to assess potential health effects.

Q How do we evaluate whether EMF exposures cause health effects?

A Animal experiments, laboratory studies of cells, clinical studies, computer simulations, and human population (epidemiological) studies all provide valuable information. When evaluating evidence that certain exposures cause disease, scientists consider results from studies in various disciplines. No single study or type of study is definitive.



Laboratory studies and human studies provide pieces of the puzzle, but no single study can give us the whole picture.

Laboratory studies

Laboratory studies with cells and animals can provide evidence to help determine if an agent such as EMF causes disease. Cellular studies can increase our understanding of the biological mechanisms by which disease occurs. Experiments with animals provide a means to observe effects of specific agents under carefully controlled conditions. Neither cellular nor animal studies, however, can recreate the complex nature of the whole human organism and its environment. Therefore, we must use caution in applying the results of cellular or animal studies directly to humans or concluding that a lack of an effect in laboratory studies proves that an agent is safe. Even with these limitations, cellular and animal studies have proven very

useful over the years for identifying and understanding the toxicity of numerous chemicals and physical agents.

Very specific laboratory conditions are needed for researchers to be able to detect EMF effects, and experimental exposures are not easily comparable to human exposures. In most cases, it is not clear how EMF actually produces the effects observed in some experiments. Without understanding how the effects occur, it is difficult to evaluate how laboratory results relate to human health effects.

Some laboratory studies have reported that EMF exposure can produce biological effects, including changes in functions of cells and tissues and subtle changes in hormone levels in animals. It is important to distinguish between a biological effect and a health effect. Many biological effects are within the normal range of variation and are not necessarily harmful. For example, bright light has a biological effect on our eyes, causing the pupils to constrict, which is a normal response.

Clinical studies

In clinical studies, researchers use sensitive instruments to monitor human physiology during controlled exposure to environmental agents. In EMF studies, volunteers are exposed to electric or magnetic fields at higher levels than those commonly encountered in everyday life. Researchers measure heart rate, brain activity, hormonal levels, and other factors in exposed and unexposed groups to look for differences resulting from EMF exposure.

Epidemiology

A valuable tool to identify human health risks is to study a human population that has experienced the exposure. This type of research is called epidemiology.

The epidemiologist observes and compares groups of people who have had or have not had certain diseases and exposures to see if the risk of disease is different between the exposed and unexposed groups. The epidemiologist does not control the exposure and cannot experimentally control all the factors that might affect the risk of disease.

Most researchers agree that epidemiology—the study of patterns and possible causes of diseases—is one of the most valuable tools to identify human health risks.

Q How do we evaluate the results of epidemiological studies of EMF?

A Many factors need to be considered when determining whether an agent causes disease. An exposure that an epidemiological study associates with increased risk of a certain disease is not always the actual cause of the disease. To judge whether an agent actually causes a health effect, several issues are considered.

Strength of association

The stronger the association between an exposure and disease, the more confident we can be that the disease is due to the exposure being studied. With cigarette smoking and lung cancer, the association is very strong—20 times the normal risk. In the studies that suggest a relationship between EMF and certain rare cancers, the association is much weaker (see page 19).

Dose-response

Epidemiological data are more convincing if disease rates increase as exposure levels increase. Such dose-response relationships have appeared in only a few EMF studies.

Consistency

Consistency requires that an association found in one study appears in other studies involving different study populations and methods. Associations found consistently are more likely to be causal. With regard to EMF, results from different studies sometimes disagree in important ways, such as what type of cancer is associated with EMF exposure. Because of this inconsistency, scientists cannot be sure whether the increased risks are due to EMF or other factors.

Biological plausibility

When associations are weak in an epidemiological study, results of laboratory studies are even more important to support the association. Many scientists remain skeptical about an association between EMF exposure and cancer because laboratory studies thus far have not shown any consistent evidence of adverse health effects, nor have results of experimental studies revealed a plausible biological explanation for such an association.

Reliability of exposure information

Another important consideration with EMF epidemiological studies is how the exposure information was obtained. Did the researchers simply estimate people's EMF exposures based on their job titles or how their houses were wired, or did they actually conduct EMF measurements? What did they measure (electric fields, magnetic fields, or both)? How often were the EMF measurements made and at

what time? In how many different places were the fields measured? More recent studies have included measurements of magnetic field exposure. Magnetic fields measured at the time a study is conducted can only estimate exposures that occurred in previous years (at the time a disease process may have begun). Lack of comprehensive exposure information makes it more difficult to interpret the results of a study, particularly considering that everyone in the industrialized world has been exposed to EMF.

Confounding

Epidemiological studies show relationships or correlations between disease and other factors such as diet, environmental conditions, and heredity. When a disease is correlated with some factor, it does not necessarily mean that the correlated factor causes the disease. It could mean that the factor occurs together with some other factor, not measured in the study, that actually causes the disease. This is called confounding.

For example, a study might show that alcohol consumption is correlated with lung cancer. This could occur if the study group consists of people who drink and also smoke tobacco, as often happens. In this example, alcohol use is correlated with lung cancer, but cigarette smoking is a confounding factor and the true cause of the disease.

Statistical significance

Researchers use statistical methods to determine the likelihood that the association between exposure and disease is due simply to chance. For a result to be considered "statistically significant," the association must be stronger than would be expected to occur by chance alone.

Meta-analysis

One way researchers try to get more information from epidemiological studies is to conduct a meta-analysis. A meta-analysis combines the summary statistics of many studies to explore their differences and, if appropriate, calculates an overall summary risk estimate. The main challenge faced by researchers performing meta-analyses is that populations, measurements, evaluation techniques, participation rates, and potential confounding factors vary in the original studies. These differences in the studies make it difficult to combine the results in a meaningful way.

Pooled analysis

Pooled analysis combines the original data from several studies and conducts a new analysis on the primary data. It requires access to the original data from individual studies and can only include diseases or factors included in all the studies, but it has the advantage that the same parameters can be applied to all studies. As with meta-analysis, pooled analysis is still subject to the limitations of the experimental

design of the original studies (for example, evaluation techniques, participation rates, etc.). Pooled analysis differs from meta-analysis, which combines the summary statistics from different studies, not their original data.

Q How do we characterize EMF exposure?

A No one knows which aspect of EMF exposure, if any, affects human health. Because of this uncertainty, in addition to the field strength, we must ask how long an exposure lasts, how it varies, and at what time of day or night it occurs. House wiring, for example, is often a significant source of EMF exposure for an individual, but the magnetic fields produced by the wiring depend on the amount of current flowing. As heating, lighting, and appliance use varies during the day, magnetic field exposure will also vary.

For many studies, researchers describe EMF exposures by estimating the average field strength. Some scientists believe that average exposure may not be the best measurement of EMF exposure and that other parameters, such as peak exposure or time of exposure, may be important.

Q What is the average field strength?

A In EMF studies, the information reported most often has been a person's EMF exposure averaged over time (average field strength). With cancer-causing chemicals, a person's average exposure over many years can be a good way to predict his or her chances of getting the disease.

There are different ways to calculate average magnetic field exposures. One method involves having a person wear a small monitor that takes many measurements over a work shift, a day, or longer. Then the average of those measurements is calculated. Another method involves placing a monitor that takes many measurements in a residence over a 24-hour or 48-hour period. Sometimes averages are calculated for people with the same occupation, people working in similar environments, or people using several brands of the same type or similar types of equipment.

Q How is EMF exposure measured in epidemiological studies?

A Epidemiologists study patterns and possible causes of diseases in human populations. These studies are usually observational rather than experimental. This means that the researcher observes and compares groups of people who have had certain diseases and exposures and looks for possible "associations." The epidemiologist must find a way to estimate the exposure that people had at an earlier time.

Association

In epidemiology, a positive association between an exposure (such as EMF) and a disease is not necessarily proof that the exposure *caused* the disease. However, the more often the exposure and disease occur together, the stronger the association, and the stronger is the possibility that the exposure may increase the risk of the disease.

Some exposure estimates for residential studies have been based on designation of households in terms of "wire codes." In other studies, measurements have been made in homes, assuming that EMF levels at the time of the measurement are similar to levels at some time in the past. Some studies involved "spot measurements." Exposure levels change as a person moves around in his or her environment, so spot measurements taken at specific locations only approximate the complex variations in exposure a person experiences. Other studies measured magnetic fields over a 24-hour or 48-hour period. Exposure levels for some occupational studies are measured by having certain employees wear personal monitors. The data taken from these monitors are sometimes used to estimate typical exposure levels for employees with certain job titles. Researchers can then estimate exposures using only an employee's job title and avoid measuring exposures of all employees.

Methods to Estimate EMF Exposure

Wire Codes

A classification of homes based on characteristics of power lines outside the home (thickness of the wires, wire configuration, etc.) and their distance from the home. This information is used to code the homes into groups with higher and lower predicted magnetic field levels.

Spot Measurement

An instantaneous or very short-term (e.g., 30-second) measurement taken at a designated location.

Time-Weighted Average

A weighted average of exposure measurements taken over a period of time that takes into account the time interval between measurements. When the measurements are taken with a monitor at a fixed sampling rate, the time-weighted average equals the arithmetic mean of the measurements.

Personal Monitor

An instrument that can be worn on the body for measuring exposure over time.

Calculated Historical Fields

An estimate based on a theoretical calculation of the magnetic field emitted by power lines using historical electrical loads on those lines.

3 Results of EMF Research

This chapter summarizes the results of EMF research worldwide, including epidemiological studies of children and adults, clinical studies of how humans react to typical EMF exposures, and laboratory research with animals and cells.

Q Is there a link between EMF exposure and childhood leukemia?

A Despite more than two decades of research to determine whether elevated EMF exposure, principally to magnetic fields, is related to an increased risk of childhood leukemia, there is still no definitive answer. Much progress has been made, however, with some lines of research leading to reasonably clear answers and others remaining unresolved. The best available evidence at this time leads to the following answers to specific questions about the link between EMF exposure and childhood leukemia:

> *Is there an association between power line configurations (wire codes) and childhood leukemia?* No.
>
> *Is there an association between measured fields and childhood leukemia?* Yes, but the association is weak, and it is not clear whether it represents a cause-and-effect relationship.

Q What is the epidemiological evidence for evaluating a link between EMF exposure and childhood leukemia?

A The initial studies, starting with the pioneering research of Dr. Nancy Wertheimer and Ed Leeper in 1979 in Denver, Colorado, focused on power line configurations near homes. Power lines were systematically evaluated and coded for their presumed ability to produce elevated magnetic fields in homes and classified into groups with higher and lower predicted magnetic field levels (see discussion of wire codes on page 15). Although the first study and two that followed in Denver and Los Angeles showed an association between wire codes indicative of elevated magnetic fields and childhood leukemia, larger, more recent studies in the central part of the United States and in several provinces of Canada did not find such an

association. In fact, combining the evidence from all the studies, we can conclude with some confidence that wire codes are not associated with a measurable increase in the risk of childhood leukemia.

The other approach to assessing EMF exposure in homes focused on the measurements of magnetic fields. Unlike wire codes, which are only applicable in North America due to the nature of the electric power distribution system, measured fields have been studied in relation to childhood leukemia in research conducted around the world, including Sweden, England, Germany, New Zealand, and Taiwan. Large, detailed studies have recently been completed in the United States, Canada, and the United Kingdom that provide the most evidence for making an evaluation. These studies have produced variable findings, some reporting small associations, others finding no associations.

National Cancer Institute Study

In 1997, after eight years of work, Dr. Martha Linet and colleagues at the National Cancer Institute (NCI) reported the results of their study of childhood acute lymphoblastic leukemia (ALL). The case-control study involved more than 1,000 children living in 9 eastern and midwestern U.S. states and is the largest epidemiological study of childhood leukemia to date in the United States. To help resolve the question of wire code versus measured magnetic fields, the NCI researchers carried out both types of exposure assessment. Overall, Linet reported little evidence that living in homes with higher measured magnetic-field levels was a disease risk and found no evidence that living in a home with a high wire code configuration increased the risk of ALL in children.

United Kingdom Childhood Cancer Study

In December 1999, Sir Richard Doll and colleagues in the United Kingdom announced that the largest study of childhood cancer ever undertaken—involving nearly 4,000 children with cancer in England, Wales, and Scotland—found no evidence of excess risk of childhood leukemia or other cancers from exposure to power-frequency magnetic fields. It should be noted, however, that because most power lines in the United Kingdom are underground, the EMF exposures of these children were mostly lower than 0.2 microtesla or 2 milligauss.

After reviewing all the data, the U.S. National Institute of Environmental Health Sciences (NIEHS) concluded in 1999 that the evidence was weak, but that it was still sufficient to warrant limited concern. The NIEHS rationale was that no individual epidemiological study provided convincing evidence linking magnetic field exposure with childhood leukemia, but the overall pattern of results for some methods of measuring exposure suggested a weak association between increasing exposure to EMF and increasing risk of childhood leukemia. The small number of cases in these studies made it impossible to firmly demonstrate this association. However, the fact that similar results had been observed in studies of different populations using a variety of study designs supported this observation.

A major challenge has been to determine whether the most highly elevated, but rarely encountered, levels of magnetic fields are associated with an increased risk of leukemia. Early reports focused on the risk associated with exposures above 2 or 3 milligauss, but the more recent studies have been large enough to also provide some information on levels above 3 or 4 milligauss. It is estimated that 4.5% of homes in the United States have magnetic fields above 3 milligauss, and 2.5% of homes have levels above 4 milligauss.

What is Cancer?

Cancer

"Cancer" is a term used to describe at least 200 different diseases, all involving uncontrolled cell growth. The frequency of cancer is measured by the incidence—the number of new cases diagnosed each year. Incidence is usually described as the number of new cases diagnosed per 100,000 people per year.

The incidence of cancer in adults in the United States is 382 per 100,000 per year, and childhood cancers account for about 1% of all cancers. The factors that influence risk differ among the forms of cancer. Known risk factors such as smoking, diet, and alcohol contribute to specific types of cancer. (For example, smoking is a known risk factor for lung cancer, bladder cancer, and oral cancer.) For many other cancers, the causes are unknown.

Leukemia

Leukemia describes a variety of cancers that arise in the bone marrow where blood cells are formed. The leukemias represent less than 4% of all cancer cases in adults but are the most common form of cancer in children. For children age 4 and under, the incidence of childhood leukemia is approximately 6 per 100,000 per year, and it decreases with age to about 2 per 100,000 per year for children 10 and older. In the United States, the incidence of adult leukemia is about 10 cases per 100,000 people per year. Little is known about what causes leukemia, although genetic factors play a role. The only known causes are ionizing radiation, benzene, and other chemicals and drugs that suppress bone marrow function, and a human T-cell leukemia virus.

Brain Cancer

Cancer of the central nervous system (the brain and spinal cord) is uncommon, with incidence in the United States now at about 6 cases in 100,000 people per year. The causes of the disease are largely unknown, although a number of studies have reported an association with certain occupational chemical exposures. Ionizing radiation to the scalp is a known risk factor for brain cancer. Factors associated with an increased risk for other types of cancer—such as smoking, diet, and excessive alcohol use—have not been found to be associated with brain cancer.

To determine what the integrated information from all the studies says about magnetic fields and childhood leukemia, two groups have conducted pooled analyses in which the original data from relevant studies were integrated and analyzed. One report (Greenland et al., 2000) combined 12 relevant studies with magnetic field measurements, and the other considered 9 such studies (Ahlbom et al., 2000). The details of the two pooled analyses are different, but their findings are similar. There is weak evidence for an association (relative risk of approximately 2) at exposures above 3 mG. However, few individuals had high exposures in these studies; therefore, even combining all studies, there is uncertainty about the strength of the association.

The following table summarizes the results for the epidemiological studies of EMF exposure and childhood leukemia analyzed in the pooled analysis by Greenland et al. (2000). The focus of the summary review was the magnetic fields that occurred three months prior to diagnosis. The results were derived from either calculated historical fields or multiple measurements of magnetic fields. The North American

Residential Exposure to Magnetic Fields and Childhood Leukemia

	Magnetic field category (mG)					
	>1 – ≤2 mG		>2 – ≤3 mG		>3 mG	
First author	Estimate	95% CL	Estimate	95% CL	Estimate	95% CL
Coghill	0.54	0.17, 1.74	No controls		No controls	
Dockerty	0.65	0.26, 1.63	2.83	0.29, 27.9	No controls	
Feychting	0.63	0.08, 4.77	0.90	0.12, 7.00	4.44	1.67, 11.7
Linet	1.07	0.82, 1.39	1.01	0.64, 1.59	1.51	0.92, 2.49
London	0.96	0.54, 1.73	0.75	0.22, 2.53	1.53	0.67, 3.50
McBride	0.89	0.62, 1.29	1.27	0.74, 2.20	1.42	0.63, 3.21
Michaelis	1.45	0.78, 2.72	1.06	0.27, 4.16	2.48	0.79, 7.81
Olsen	0.67	0.07, 6.42	No cases		2.00	0.40, 9.93
Savitz	1.61	0.64, 4.11	1.29	0.27, 6.26	3.87	0.87, 17.3
Tomenius	0.57	0.33, 0.99	0.88	0.33, 2.36	1.41	0.38, 5.29
Tynes	1.06	0.25, 4.53	No cases		No cases	
Verkasalo	1.11	0.14, 9.07	No cases		2.00	0.23, 17.7
Study summary	0.95	0.80, 1.12	1.06	0.79, 1.42	1.69*	1.25, 2.29
	1 – <2 mG		2 – <4 mG		≥4 mG	
**United Kingdom	0.84	0.57, 1.24	0.98	0.50, 1.93	1.00	0.30, 3.37

95% CL = 95% confidence limits.
Source: Greenland et al., 2000.

* Mantel-Haenszel analysis (p = 0.01). Maximum-likelihood summaries differed by less than 1% from these summaries; based on 2,656 cases and 7,084 controls. Adjusting for age, sex, and other variables had little effect on summary results.

** These data are from a recent United Kingdom study not included in the Greenland analysis but included in another pooled analysis (Ahlbom et al. 2000). The United Kingdom study included 1,073 cases and 2,224 controls.

For this table, the column headed "estimate" describes the relative risk. Relative risk is the ratio of the risk of childhood leukemia for those in a magnetic field exposure group compared to persons with exposure levels of 1.0 mG or less. For example, Coghill estimated that children with exposures between 1 and 2 mG have 0.54 times the risk of children whose exposures were less than 1 mG. London's study estimates that children whose exposures were greater than 3 mG have 1.53 times the risk of children whose exposures were less than 1 mG. The column headed "95% CL" (confidence limits) describes how much random variation is in the estimate of relative risk. The estimate may be off by some amount due to random variation, and the width of the confidence limits gives some notion of that variation. For example, in Coghill's estimate of 0.54 for the relative risk, values as low as 0.17 or as high as 1.74 would not be statistically significantly different from the value of 0.54. Note there is a wide range of estimates of relative risk across the studies and wide confidence limits for many studies. In light of these findings, the pooling of results can be extremely helpful to calculate an overall estimate, much better than can be obtained from any study taken alone.

studies (Linet, London, McBride, Savitz) were 60 Hz; all other studies were 50 Hz. Results from the recent study from the United Kingdom (see page 17) are also included in the table. This study was included in the analysis by Ahlbom et al. (2000). The relative risk estimates from the individual studies show little or no association of magnetic fields with childhood leukemia. The study summary for the pooled analysis by Greenland et al. (2000) shows a weak association between childhood leukemia and magnetic field exposures greater 3 mG.

Q Is there a link between EMF exposure and childhood brain cancer or other forms of cancer in children?

A Although the earliest studies suggested an association between EMF exposure and all forms of childhood cancer, those initial findings have not been confirmed by other studies. At present, the available series of studies indicates no association between EMF exposure and childhood cancers other than leukemia. Far fewer of these studies have been conducted than studies of childhood leukemia.

Q Is there a link between residential EMF exposure and cancer in adults?

A The few studies that have been conducted to address EMF and adult cancer do not provide strong evidence for an association. Thus, a link has not been established between residential EMF exposure and adult cancers, including leukemia, brain cancer, and breast cancer (see table below).

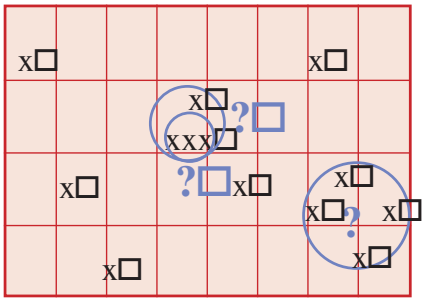
Residential Exposure to Magnetic Fields and Adult Cancer

			Results (odds ratios)		
First author	Location	Type of exposure data	Leukemia	CNS tumors	All cancers
Coleman	United Kingdom	Calculated historical fields	0.92	NA	NA
Feychting and Ahlbom	Sweden	Calculated & spot measurements	1.5*	0.7	NA
Li	Taiwan	Calculated historical fields	1.4*	1.1	NA
Li	Taiwan	Calculated historical fields		1.1 (breast cancer)	
McDowall	United Kingdom	Calculated historical fields	1.43	NA	1.03
Severson	Seattle	Wire codes & spot measurements	0.75	NA	NA
Wrensch	San Francisco	Wire codes & spot measurements	NA	0.9	NA
Youngson	United Kingdom	Calculated historical fields	1.88	NA	NA

CNS = central nervous system.
*The number is statistically significant (greater than expected by chance).
Study results are listed as "odds ratios" (OR). An odds ratio of 1.00 means there was no increase or decrease in risk. In other words, the odds that the people in the study who had the disease (in this case, cancer) and were exposed to a particular agent (in this case, EMF) are the same as for the people in the study who did not have the disease. An odds ratio greater than 1 may occur simply by chance, unless it is statistically significant.

Q Have clusters of cancer or other adverse health effects been linked to EMF exposure?

A An unusually large number of cancers, miscarriages, or other adverse health effects that occur in one area or over one period of time is called a "cluster." Sometimes clusters provide an early warning of a health hazard. But most of the time the reason for the cluster is not known. There have been no proven instances of cancer clusters linked with EMF exposure.



The definition of a "cluster" depends on how large an area is included. Cancer cases (x's in illustration) in a city, neighborhood, or workplace may occur in ways that suggest a cluster due to a common environmental cause. Often these patterns turn out to be due to chance. Delineation of a cluster is subjective—where do you draw the circles?

Q If EMF does cause or promote cancer, shouldn't cancer rates have increased along with the increased use of electricity?

A Not necessarily. Although the use of electricity has increased greatly over the years, EMF exposures may not have increased. Changes in building wiring codes and in the design of electrical appliances have in some cases resulted in lower magnetic field levels. Rates for various types of cancer have shown both increases and decreases through the years, due in part to improved prevention, diagnosis, reporting, and treatment.

Q Is there a link between EMF exposure in electrical occupations and cancer?

A For almost as long as we have been concerned with residential exposure to EMF and childhood cancers, researchers have been studying workplace exposure to EMF and adult cancers, focusing on leukemia and brain cancer. This research began with surveys of job titles and cancer risks, but has progressed to include very large, detailed studies of the health of workers, especially electric utility workers, in the United States, Canada, France, England, and several Northern European countries. Some studies have found evidence that suggests a link between EMF exposure and both leukemia and brain cancer, whereas other studies of similar size and quality have not found such associations.

California
A 1993 study of 36,000 California electric utility workers reported no strong, consistent evidence of an association between magnetic fields and any type of cancer.

Canada/France
A 1994 study of more than 200,000 utility workers in 3 utility companies in Canada and France reported no significant association between all leukemias combined and cumulative exposure to magnetic fields. There was a slight, but not statistically significant, increase in brain cancer. The researchers concluded that the study did not provide clear-cut evidence that magnetic field exposures caused leukemia or brain cancer.

North Carolina
Results of a 1995 study involving more than 138,000 utility workers at 5 electric utilities in the United States did not support an association between occupational magnetic field exposure and leukemia, but suggested a link to brain cancer.

Denmark
In 1997 a study of workers employed in all Danish utility companies reported a small, but statistically significant, excess risk for all cancers combined and for lung cancer. No excess risk was observed for leukemia, brain cancers, or breast cancer.

United Kingdom
A 1997 study among electrical workers in the United Kingdom did not find an excess risk for brain cancer. An extension of this work reported in 2001 also found no increased risk for brain cancer.

Efforts have also been made to pool the findings across several of the above studies to produce more accurate estimates of the association between EMF and cancer (Kheifets et al., 1999). The combined summary statistics across studies provide insufficient evidence for an association between EMF exposure in the workplace and either leukemia or brain cancer.

Q Have studies of workers in other industries suggested a link between EMF exposure and cancer?

A One of the largest studies to report an association between cancer and magnetic field exposure in a broad range of industries was conducted in Sweden (1993). The study included an assessment of EMF exposure in 1,015 different workplaces and involved more than 1,600 people in 169 different occupations. An association was reported between estimated EMF exposure and increased risk for chronic lymphocytic leukemia. An association was also reported between exposure to magnetic fields and brain cancer, but there was no dose-response relationship.

Another Swedish study (1994) found an excess risk of lymphocytic leukemia among railway engine drivers and conductors. However, the total cancer incidence (all tumors included) for this group of workers was lower than in the general Swedish population. A study of Norwegian railway workers found no evidence for an association between EMF exposure and leukemia or brain cancer. Although both positive and negative effects of EMF exposure have been reported, the majority of studies show no effects.

Q Is there a link between EMF exposure and breast cancer?

A Researchers have been interested in the possibility that EMF exposure might cause breast cancer, in part because breast cancer is such a common disease in adult women. Early studies identified a few electrical workers with male breast cancer, a very rare disease. A link between EMF exposure and alterations in the hormone melatonin was considered a possible hypothesis (see page 24). This idea provided motivation to conduct research addressing a possible link between EMF exposure and breast cancer. Overall, the published epidemiological studies have not shown such an association.

Q What have we learned from clinical studies?

A Laboratory studies with human volunteers have attempted to answer questions such as,

Does EMF exposure alter normal brain and heart function?
Does EMF exposure at night affect sleep patterns?
Does EMF exposure affect the immune system?
Does EMF exposure affect hormones?

The following kinds of biological effects have been reported. Keep in mind that a biological effect is simply a measurable change in some biological response. It may or may not have any bearing on health.

Heart rate

An inconsistent effect on heart rate by EMF exposure has been reported. When observed, the biological response is small (on average, a slowing of about three to five beats per minute), and the response does not persist once exposure has ended.

Two laboratories, one in the United States and one in Australia, have reported effects of EMF on heart rate variability. Exposures used in these experiments were relatively high (about 300 mG), and lower exposures failed to produce the effect. Effects have not been observed consistently in repeated experiments.

Sleep electrophysiology

A laboratory report suggested that overnight exposure to 60-Hz magnetic fields may disrupt brain electrical activity (EEG) during night sleep. In this study subjects were exposed to either continuous or intermittent magnetic fields of 283 mG. Individuals exposed to the intermittent magnetic fields showed alterations in traditional EEG sleep parameters indicative of a pattern of poor and disrupted sleep. Several studies have reported no effect with continuous exposure.

Hormones, immune system, and blood chemistry

Several clinical studies with human volunteers have evaluated the effects of power-frequency EMF exposure on hormones, the immune system, and blood chemistry. These studies provide little evidence for any consistent effect.

Melatonin

The hormone melatonin is secreted mainly at night and primarily by the pineal gland, a small gland attached to the brain. Some laboratory experiments with cells and animals have shown that melatonin can slow the growth of cancer cells, including breast cancer cells. Suppressed nocturnal melatonin levels have been observed in some studies of laboratory animals exposed to both electric and magnetic fields. These observations led to the hypothesis that EMF exposure might reduce melatonin and thereby weaken one of the body's defenses against cancer.

Many clinical studies with human volunteers have now examined whether various levels and types of magnetic field exposure affect blood levels of melatonin. Exposure of human volunteers at night to power-frequency EMF under controlled laboratory conditions has no apparent effect on melatonin. Some studies of people exposed to EMF at work or at home do report evidence for a small suppression of melatonin. It is not clear whether the decreases in melatonin reported under environmental conditions are related to the presence of EMF exposure or to other factors.

Q What effects of EMF have been reported in laboratory studies of cells?

A Over the years, scientists have conducted more than 1,000 laboratory studies to investigate potential biological effects of EMF exposure. Most have been *in vitro* studies; that is, studies carried out on cells isolated from animals and plants, or on cell components such as cell membranes. Other studies involved animals, mainly rats and mice. In general, these studies do not demonstrate a consistent effect of EMF exposure.

Most *in vitro* studies have used magnetic fields of 1,000 mG (100 µT) or higher, exposures that far exceed daily human exposures. In most incidences, when one laboratory has reported effects of EMF exposure on cells, other laboratories have not been able to reproduce the findings. For such research results to be widely accepted by scientists as valid, they must be replicated—that is, scientists in other laboratories should be able to repeat the experiment and get similar results. Cellular studies have investigated potential EMF effects on cell proliferation and differentiation, gene expression, enzyme activity, melatonin, and DNA. Scientists reviewing the EMF research literature find overall that the cellular studies provide little convincing evidence of EMF effects at environmental levels.

Q Have effects of EMF been reported in laboratory studies in animals?

A Researchers have published more than 30 detailed reports on both long-term and short-term studies of EMF exposures in laboratory animals (bioassays). Long-term animal bioassays constitute an important group of studies in EMF research. Such studies have a proven record for predicting the carcinogenicity of chemicals, physical agents, and other suspected cancer-causing agents. In the EMF studies, large groups of mice or rats were continuously exposed to EMF for two years or longer and were then evaluated for cancer. The U.S. National Toxicology Program (http://ntp-server.niehs.nih.gov/) has an extensive historical database for hundreds of different chemical and physical agents evaluated using this model. EMF long-term bioassays examined leukemia, brain cancer, and breast cancer—the diseases some epidemiological studies have associated with EMF exposure (see pages 16–23).

Several different approaches have been used to evaluate effects of EMF exposure in animal bioassays. To investigate whether EMF could promote cancer after genetic damage had occurred, some long-term studies used cancer initiators such as ultraviolet light, radiation, or certain chemicals that are known to cause genetic damage. Researchers compared groups of animals treated with cancer initiators to groups treated with cancer initiators and then exposed to EMF, to see if EMF exposure promoted the cancer growth (initiation-promotion model). Other studies tested the cancer promotion potential of EMF using mice that were predisposed to cancer because they had defects in the genes that control cancer.

Animal Leukemia Studies: Long-Term, Continuous Exposure Studies, Two or More Years in Length			
First author	Sex/species	Exposure/animal numbers	Results
Babbitt (U.S.)	Female mice	14,000 mG, 190 or 380 mice per group. Some groups treated with ionizing radiation.	No effect
Boorman (U.S.)	Male and female rats	20 to 10,000 mG, 100 per group	No effect
McCormick (U.S.)	Male and female mice	20 to 10,000 mG, 100 per group	No effect
Mandeville (Canada)	Female rats	20 to 20,000 mG, 50 per group *In utero* exposure	No effect
Yasui (Japan)	Male and female rats	5,000 to 50,000 mG, 50 per group	No effect

10 milligauss (mG) = 1 microtesla (μT) = 0.001 millitesla (mT)

Leukemia

Fifteen animal leukemia studies have been completed and reported. Most tested for effects of exposure to power-frequency (60-Hz) magnetic fields using rodents. Results of these studies were largely negative. The Babbitt study evaluated the subtypes of leukemia. The data provide no support for the reported epidemiology findings of leukemia from EMF exposure. Many scientists feel that the lack of effects seen in these laboratory leukemia studies significantly weakens the case for EMF as a cause of leukemia.

Breast cancer

Researchers in the Ukraine, Germany, Sweden, and the United States have used initiation-promotion models to investigate whether EMF exposure promotes breast cancer in rats.

The results of these studies are mixed; while the German studies showed some effects, the Swedish and U.S. studies showed none. Studies in Germany reported effects on the numbers of tumors and tumor volume. A National Toxicology Program long-term bioassay performed without the use of other cancer-initiating substances showed no effects of EMF exposure on the development of mammary tumors in rats and mice.

The explanation for the observed difference among these studies is not readily apparent. Within the limits of the experimental rodent model of mammary carcinogenesis, no conclusions are possible regarding a promoting effect of EMF on chemically induced mammary cancer.

Other cancers

Tests of EMF effects on skin cancer, liver cancer, and brain cancer have been conducted using both initiation-promotion models and non-initiated long-term bioassays. All are negative.

Three positive studies were reported for a co-promotion model of skin cancer in mice. The mice were exposed to EMF plus cancer-causing chemicals after cancers

had already been initiated. The same research team as well as an independent laboratory were unable to reproduce these results in subsequent experiments.

Non-cancer effects

Many animal studies have investigated whether EMF can cause health problems other than cancer. Researchers have examined many endpoints, including birth defects, immune system function, reproduction, behavior, and learning. Overall, animal studies do not support EMF effects on non-cancer endpoints.

Q Can EMF exposure damage DNA?

A Studies have attempted to determine whether EMF has genotoxic potential; that is, whether EMF exposure can alter the genetic material of living organisms. This question is important because genotoxic agents often also cause cancer or birth defects. Studies of genotoxicity have included tests on bacteria, fruit flies, and some tests on rats and mice. Nearly 100 studies on EMF genotoxicity have been reported. Most evidence suggests that EMF exposure is not genotoxic. Based on experiments with cells, some researchers have suggested that EMF exposure may inhibit the cell's ability to repair normal DNA damage, but this idea remains speculative because of the lack of genotoxicity observed in EMF animal studies.

4 Your EMF Environment

This chapter discusses typical magnetic field exposures in home and work environments and identifies common EMF sources and field intensities associated with these sources.

Q How do we define EMF exposure?

A Scientists are still uncertain about the best way to define "exposure" because experiments have yet to show which aspect of the field, if any, may be relevant to reported biological effects. Important aspects of exposure could be the highest intensity, the average intensity, or the amount of time spent above a certain baseline level. The most widely used measure of EMF exposure has been the time-weighted average magnetic field level (see discussion on page 15).

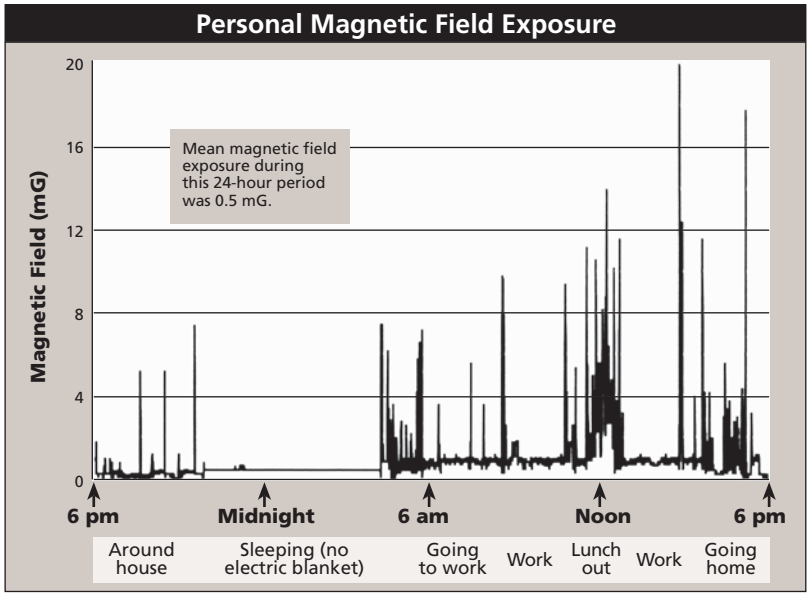
Q How is EMF exposure measured?

A Several kinds of personal exposure meters are now available. These automatically record the magnetic field as it varies over time. To determine a person's EMF exposure, the personal exposure meter is usually worn at the waist or is placed as close as possible to the person during the course of a work shift or day.

EMF can also be measured using survey meters, sometimes called "gaussmeters." These measure the EMF levels in a given location at a given time. Such measurements do not necessarily reflect personal EMF exposure because they are not always taken at the distance from the EMF source that the person would typically be from the source. Measurements are not always made in a location for the same amount of time that a person spends there. Such "spot measurements" also fail to capture variations of the field over time, which can be significant.

Q What are some typical EMF exposures?

A The figure below is an example of data collected with a personal exposure meter.



In the above example, the magnetic field was measured every 1.5 seconds over a period of 24 hours. For this person, exposure at home was very low. The occasional spikes (short exposure to high fields) occurred when the person drove or walked under power lines or over underground power lines or was close to appliances in the home or office.

Several studies have used personal exposure meters to measure field exposure in different environments. These studies tend to show that appliances and building wiring contribute to the magnetic field exposure that most people receive while at home. People living close to high voltage power lines that carry a lot of current tend to have higher overall field exposures. As shown on page 32, there is considerable variation among houses.

Q What are typical EMF exposures for people living in the United States?

A Most people in the United States are exposed to magnetic fields that average less than 2 milligauss (mG), although individual exposures vary.

The following table shows the estimated average magnetic field exposure of the U.S. population, according to a study commissioned by the U.S. government as part

of the EMF Research and Public Information Dissemination (EMF RAPID) Program (see page 50). This study measured magnetic field exposure of about 1,000 people of all ages randomly selected among the U.S. population. Participants wore or carried with them a small personal exposure meter and kept a diary of their activities both at home and away from home. Magnetic field values were automatically recorded twice a second for 24 hours. The study reported that exposure to magnetic fields is similar in different regions of the country and similar for both men and women.

Estimated Average Magnetic Field Exposure of the U.S. Population

Average 24-hour field (mG)	Population exposed (%)	95% confidence interval (%)	People exposed* (millions)
> 0.5	76.3	73.8–78.9	197–211
> 1	43.6	40.9–46.5	109–124
> 2	14.3	11.8–17.3	31.5–46.2
> 3	6.3	4.7–8.5	12.5–22.7
> 4	3.6	2.5–5.2	6.7–13.9
> 5	2.42	1.65–3.55	4.4–9.5
> 7.5	0.58	0.29–1.16	0.77–3.1
> 10	0.46	0.20–1.05	0.53–2.8
> 15	0.17	0.035–0.83	0.09–2.2

*Based on a population of 267 million. This table summarizes some of the results of a study that sampled about 1,000 people in the United States. In the first row, for example, we find that 76.3% of the sample population had a 24-hour average exposure of greater than 0.5 mG. Assuming that the sample was random, we can use statistics to say that we are 95% confident that the percentage of the overall U.S. population exposed to greater than 0.5 mG is between 73.8% and 78.9%. Source: Zaffanella, 1993.

The following table shows average magnetic fields experienced during different types of activities. In general, magnetic fields are greater at work than at home.

Estimated Average Magnetic Field Exposure of the U.S. Population for Various Activities

Average field (mG)	Population exposed (%)				
	Home	Bed	Work	School	Travel
> 0.5	69	48	81	63	87
> 1	38	30	49	25	48
> 2	14	14	20	3.5	13
> 3	7.8	7.2	13	1.6	4.1
> 4	4.7	4.7	8.0	< 1	1.5
> 5	3.5	3.7	4.6		1.0
> 7.5	1.2	1.6	2.5		0.5
> 10	0.9	0.8	1.3		< 0.2
> 15	0.1	0.1	0.9		

Source: Zaffanella, 1993.

Q What levels of EMF are found in common environments?

A Magnetic field exposures can vary greatly from site to site for any type of environment. The data shown in the following table are median measurements taken at four different sites for each environment category.

EMF Exposures in Common Environments
Magnetic fields measured in milligauss (mG)

Environment	Median* exposure	Top 5th percentile
OFFICE BUILDING		
Support staff	0.6	3.7
Professional	0.5	2.6
Maintenance	0.6	3.8
Visitor	0.6	2.1
SCHOOL		
Teacher	0.6	3.3
Student	0.5	2.9
Custodian	1.0	4.9
Administrative staff	1.3	6.9
HOSPITAL		
Patient	0.6	3.6
Medical staff	0.8	5.6
Visitor	0.6	2.4
Maintenance	0.6	5.9
MACHINE SHOP		
Machinist	0.4	6.0
Welder	1.1	24.6
Engineer	1.0	5.1
Assembler	0.5	6.4
Office staff	0.7	4.7
GROCERY STORE		
Cashier	2.7	11.9
Butcher	2.4	12.8
Office staff	2.1	7.1
Customer	1.1	7.7

*The median of four measurements. For this table, the median is the average of the two middle measurements. Source: National Institute for Occupational Safety and Health.

Q What EMF field levels are encountered in the home?

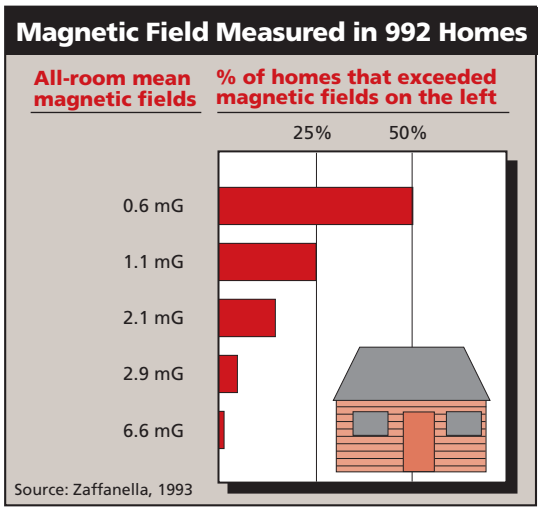
A

Electric fields

Electric fields in the home, on average, range from 0 to 10 volts per meter. They can be hundreds, thousands, or even millions of times weaker than those encountered outdoors near power lines. Electric fields directly beneath power lines may vary from a few volts per meter for some overhead distribution lines to several thousands of volts per meter for extra high voltage power lines. Electric fields from power lines rapidly become weaker with distance and can be greatly reduced by walls and roofs of buildings.

Magnetic fields

Magnetic fields are not blocked by most materials. Magnetic fields encountered in homes vary greatly. Magnetic fields rapidly become weaker with distance from the source.



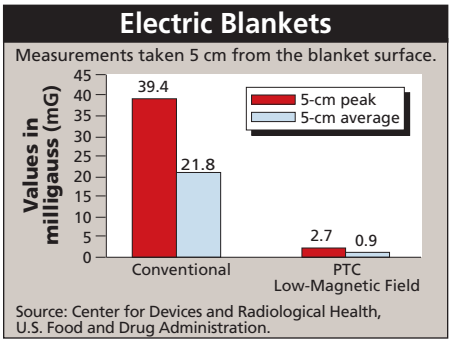
The chart on the left summarizes data from a study by the Electric Power Research Institute (EPRI) in which spot measurements of magnetic fields were made in the center of rooms in 992 homes throughout the United States. Half of the houses studied had magnetic field measurements of 0.6 mG or less, when the average of measurements from all the rooms in the house was calculated (the all-room mean magnetic field). The all-room mean magnetic field for all houses studied was 0.9 mG. The measurements were made away from electrical appliances and reflect primarily the fields from household wiring and outside power lines.

If you are comparing the information in this chart with measurements in your own home, keep in mind that this chart shows averages of measurements taken throughout the homes, not the single highest measurement found in the home.

Q What are EMF levels close to electrical appliances?

A Magnetic fields close to electrical appliances are often much stronger than those from other sources, including magnetic fields directly under power lines. Appliance fields decrease in strength with distance more quickly than do power line fields.

The following table, based on data gathered in 1992, lists the EMF levels generated by common electrical appliances. Magnetic field strength (magnitude) does not depend on how large, complex, powerful, or noisy the appliance is. Magnetic fields near large appliances are often weaker than those near small devices. Appliances in your home may have been redesigned since the data in the table were collected, and the EMF they produce may differ considerably from the levels shown here.



The graph shows magnetic fields produced by electric blankets, including conventional 110-V electric blankets as well as the PTC (positive temperature coefficient) low-magnetic-field blankets. The fields were measured at a distance of about 2 inches from the blanket's surface, roughly the distance from the blanket to the user's internal organs. Because of the wiring, magnetic field strengths vary from point to point on the blanket. The graph reflects this and gives both the peak and the average measurement.

Sources of Magnetic Fields (mG)*

Office Sources

	Distance from source 6″	1′	2′	4′
AIR CLEANERS				
Lowest	110	20	3	–
Median	180	35	5	1
Highest	250	50	8	2
COPY MACHINES				
Lowest	4	2	1	–
Median	90	20	7	1
Highest	200	40	13	4
FAX MACHINES				
Lowest	4	–	–	–
Median	6	–	–	–
Highest	9	2	–	–
FLUORESCENT LIGHTS				
Lowest	20	–	–	–
Median	40	6	2	–
Highest	100	30	8	4
ELECTRIC PENCIL SHARPENERS				
Lowest	20	8	5	–
Median	200	70	20	2
Highest	300	90	30	30
VIDEO DISPLAY TERMINALS (see page 48) (PCs with color monitors)**				
Lowest	7	2	1	–
Median	14	5	2	–
Highest	20	6	3	–

Bathroom Sources

	Distance from source 6″	1′	2′	4′
HAIR DRYERS				
Lowest	1	–	–	–
Median	300	1	–	–
Highest	700	70	10	1
ELECTRIC SHAVERS				
Lowest	4	–	–	–
Median	100	20	–	–
Highest	600	100	10	1

Workshop Sources

	Distance from source 6″	1′	2′	4′
BATTERY CHARGERS				
Lowest	3	2	–	–
Median	30	3	–	–
Highest	50	4	–	–
DRILLS				
Lowest	100	20	3	–
Median	150	30	4	–
Highest	200	40	6	–
POWER SAWS				
Lowest	50	9	1	–
Median	200	40	5	–
Highest	1000	300	40	4
ELECTRIC SCREWDRIVERS (while charging)				
Lowest	–	–	–	–
Median	–	–	–	–
Highest	–	–	–	–

Living/Family Room Sources

	Distance from source 1′	2′	4′
CEILING FANS			
Lowest	–	–	–
Median	3	–	–
Highest	50	6	1
WINDOW AIR CONDITIONERS			
Lowest	–	–	–
Median	3	1	–
Highest	20	6	4
COLOR TELEVISIONS**			
Lowest	–	–	–
Median	7	2	–
Highest	20	8	4

Continued

Sources of Magnetic Fields (mG)*

	Distance from source 6″	1′	2′	4′
Kitchen Sources				
BLENDERS				
Lowest	30	5	–	–
Median	70	10	2	–
Highest	100	20	3	–
CAN OPENERS				
Lowest	500	40	3	–
Median	600	150	20	2
Highest	1500	300	30	4
COFFEE MAKERS				
Lowest	4	–	–	–
Median	7	–	–	–
Highest	10	1	–	–
DISHWASHERS				
Lowest	10	6	2	–
Median	20	10	4	–
Highest	100	30	7	1
FOOD PROCESSORS				
Lowest	20	5	–	–
Median	30	6	2	–
Highest	130	20	3	–
GARBAGE DISPOSALS				
Lowest	60	8	1	–
Median	80	10	2	–
Highest	100	20	3	–
MICROWAVE OVENS***				
Lowest	100	1	1	–
Median	200	4	10	2
Highest	300	200	30	20
MIXERS				
Lowest	30	5	–	–
Median	100	10	1	–
Highest	600	100	10	–

	Distance from source 6″	1′	2′	4′
Kitchen Sources				
ELECTRIC OVENS				
Lowest	4	1	–	–
Median	9	4	–	–
Highest	20	5	1	–
ELECTRIC RANGES				
Lowest	20	–	–	–
Median	30	8	2	–
Highest	200	30	9	6
REFRIGERATORS				
Lowest	–	–	–	–
Median	2	2	1	–
Highest	40	20	10	10
TOASTERS				
Lowest	5	–	–	–
Median	10	3	–	–
Highest	20	7	–	–
Bedroom Sources				
DIGITAL CLOCK****				
Lowest		–	–	–
Median		1	–	–
High		8	2	1
ANALOG CLOCKS (conventional clockface)****				
Lowest		1	–	–
Median		15	2	–
Highest		30	5	3
BABY MONITOR (unit nearest child)				
Lowest	4	–	–	–
Median	6	1	–	–
Highest	15	2	–	–

Continued

Sources of Magnetic Fields (mG)*

	Distance from source 6″	1′	2′	4′
Laundry/Utility Sources				
ELECTRIC CLOTHES DRYERS				
Lowest	2	–	–	–
Median	3	2	–	–
Highest	10	3	–	–
WASHING MACHINES				
Lowest	4	1	–	–
Median	20	7	1	–
Highest	100	30	6	–
IRONS				
Lowest	6	1	–	–
Median	8	1	–	–
Highest	20	3	–	–

	Distance from source 6″	1′	2′	4′
Laundry/Utility Sources				
PORTABLE HEATERS				
Lowest	5	1	–	–
Median	100	20	4	–
Highest	150	40	8	1
VACUUM CLEANERS				
Lowest	100	20	4	–
Median	300	60	10	1
Highest	700	200	50	10
SEWING MACHINES				

Home sewing machines can produce magnetic fields of 12 mG at chest level and 5 mG at head level. Magnetic fields as high as 35 mG at chest level and 215 mG at knee level have been measured from industrial sewing machine models (Sobel, 1994).

Source: EMF In Your Environment, U.S. Environmental Protection Agency, 1992.

* Dash (–) means that the magnetic field at this distance from the operating appliance could not be distinguished from background measurements taken before the appliance had been turned on.

** Some appliances produce both 60-Hz and higher frequency fields. For example, televisions and computer screens produce fields at 10,000-30,000 Hz (10-30 kHz) as well as 60-Hz fields.

*** Microwave ovens produce 60-Hz fields of several hundred milligauss, but they also create microwave energy inside the appliance that is at a much higher frequency (about 2.45 billion hertz). We are shielded from the higher frequency fields but not from the 60-Hz fields.

**** Most digital clocks have low magnetic fields. In some analog clocks, however, higher magnetic fields are produced by the motor that drives the hands. In the above table, the clocks are electrically powered using alternating current, as are all the appliances described in these tables.

Q What EMF levels are found near power lines?

A Power transmission lines bring power from a generating station to an electrical substation. Power distribution lines bring power from the substation to your home. Transmission and distribution lines can be either overhead or underground. Overhead lines produce both electric fields and magnetic fields. Underground lines do not produce electric fields above ground but may produce magnetic fields above ground.

Power transmission lines

Typical EMF levels for transmission lines are shown in the chart on page 37. At a distance of 300 feet and at times of average electricity demand, the magnetic fields from many lines can be similar to typical background levels found in most homes. The distance at which the magnetic field from the line becomes indistinguishable from typical background levels differs for different types of lines.

Power distribution lines

Typical voltage for power distribution lines in North America ranges from 4 to 24 kilovolts (kV). Electric field levels directly beneath overhead distribution lines may vary from a few volts per meter to 100 or 200 volts per meter. Magnetic fields directly beneath overhead distribution lines typically range from 10 to 20 mG for main feeders and less than 10 mG for laterals. Such levels are also typical directly above underground lines. Peak EMF levels, however, can vary considerably depending on the amount of current carried by the line. Peak magnetic field levels as high as 70 mG have been measured directly below overhead distribution lines and as high as 40 mG above underground lines.

Q How strong is the EMF from electric power substations?

A In general, the strongest EMF around the outside of a substation comes from the power lines entering and leaving the substation. The strength of the EMF from equipment within the substations, such as transformers, reactors, and capacitor banks, decreases rapidly with increasing distance. Beyond the substation fence or wall, the EMF produced by the substation equipment is typically indistinguishable from background levels.

Q Do electrical workers have higher EMF exposure than other workers?

A Most of the information we have about occupational EMF exposure comes from studies of electric utility workers. It is therefore difficult to compare electrical workers' EMF exposures with those of other workers because there is less information about EMF exposures in work environments other than electric utilities. Early studies did not include actual measurements of EMF exposure on the job but used job titles as an estimate of EMF exposure among electrical workers. Recent studies, however, have included extensive EMF exposure assessments.

A report published in 1994 provides some information about estimated EMF exposures of workers in Los Angeles in a number of electrical jobs in electric utilities and other industries. Electrical workers had higher average EMF exposures (9.6 mG) than did workers in other jobs (1.7 mG). For this study, the category "electrical workers" included electrical engineering technicians, electrical engineers, electricians, power line workers, power station operators, telephone line workers, TV repairers, and welders.

Typical EMF Levels for Power Transmission Lines*

115 kV

Approx. Edge of Right-of-Way

		15 m (50 ft)	30 m (100 ft)	61 m (200 ft)	91 m (300 ft)
Electric Field (kV/m)	1.0	0.5	0.07	0.01	0.003
Mean Magnetic Field (mG)	29.7	6.5	1.7	0.4	0.2

230 kV

Approx. Edge of Right-of-Way

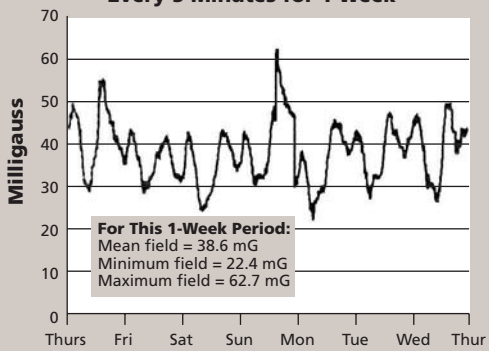
		15 m (50 ft)	30 m (100 ft)	61 m (200 ft)	91 m (300 ft)
Electric Field (kV/m)	2.0	1.5	0.3	0.05	0.01
Mean Magnetic Field (mG)	57.5	19.5	7.1	1.8	0.8

500 kV

Approx. Edge of Right-of-Way

		20 m (65 ft)	30 m (100 ft)	61 m (200 ft)	91 m (300 ft)
Electric Field (kV/m)	7.0	3.0	1.0	0.3	0.1
Mean Magnetic Field (mG)	86.7	29.4	12.6	3.2	1.4

Magnetic Field from a 500-kV Transmission Line Measured on the Right-of-Way Every 5 Minutes for 1 Week



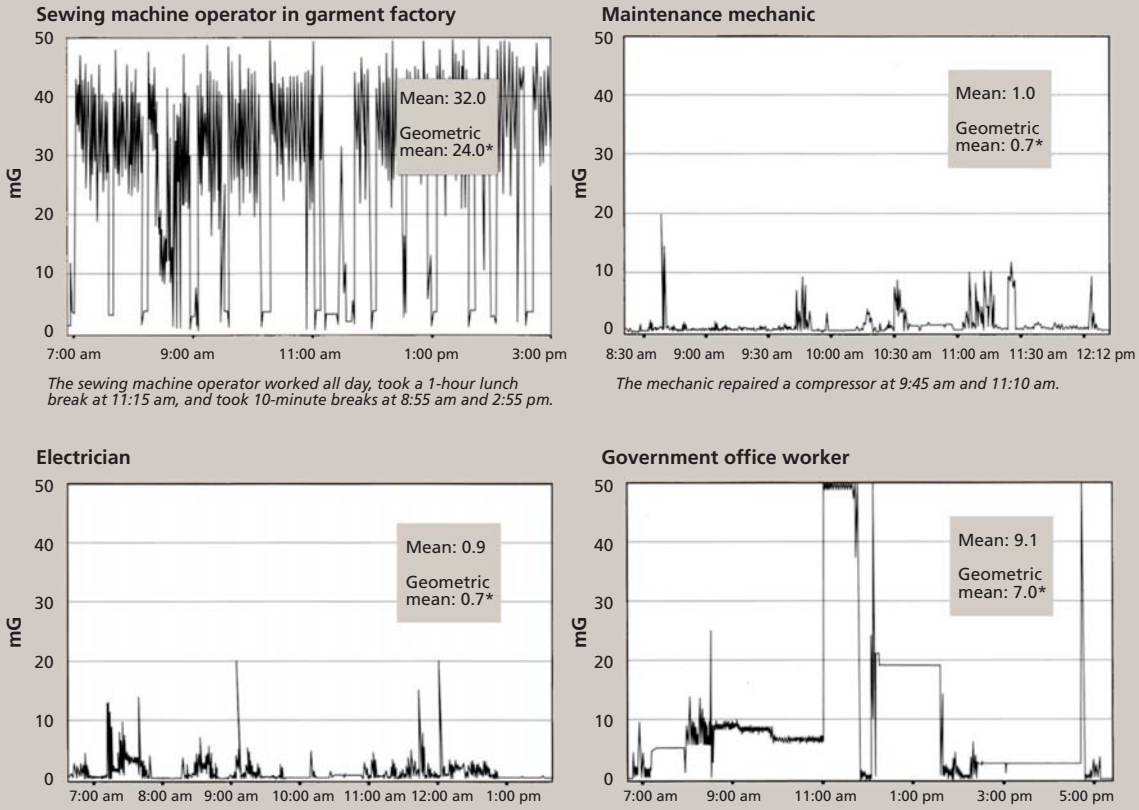
Electric fields from power lines are relatively stable because line voltage doesn't change very much. Magnetic fields on most lines fluctuate greatly as current changes in response to changing loads. Magnetic fields must be described statistically in terms of averages, maximums, etc. The magnetic fields above are means calculated for 321 power lines for 1990 annual mean loads. During peak loads (about 1% of the time), magnetic fields are about twice as strong as the mean levels above. The graph on the left is an example of how the magnetic field varied during one week for one 500-kV transmission line.

*These are typical EMFs at 1 m (3.3 ft) above ground for various distances from power lines in the Pacific Northwest. They are for general information. For information about a specific line, contact the utility that operates the line.
Source: Bonneville Power Administration, 1994.

Q What are possible EMF exposures in the workplace?

A The figures below are examples of magnetic field exposures determined with exposure meters worn by four workers in different occupations. These measurements demonstrate how EMF exposures vary among individual workers. They do not necessarily represent typical EMF exposures for workers in these occupations.

Magnetic Field Exposures of Workers (mG)



The sewing machine operator worked all day, took a 1-hour lunch break at 11:15 am, and took 10-minute breaks at 8:55 am and 2:55 pm.

The mechanic repaired a compressor at 9:45 am and 11:10 am.

The electrician repaired a large air-conditioning motor at 9:10 am and at 11:45 am.

The government worker was at the copy machine at 8:00 am, at the computer from 11:00 am to 1:00 pm and also from 2:30 pm to 4:30 pm.

*The geometric mean is calculated by squaring the values, adding the squares, and then taking the square root of the sum.
Source: National Institute for Occupational Safety and Health and U.S. Department of Energy.

The tables below and on page 41 can give you a general idea about magnetic field levels for different jobs and around various kinds of electrical equipment. It is important to remember that EMF levels depend on the actual equipment used in

EMF Measurements During a Workday

Industry and occupation	ELF magnetic fields measured in mG: Median for occupation*	ELF magnetic fields measured in mG: Range for 90% of workers**
ELECTRICAL WORKERS IN VARIOUS INDUSTRIES		
Electrical engineers	1.7	0.5–12.0
Construction electricians	3.1	1.6–12.1
TV repairers	4.3	0.6–8.6
Welders	9.5	1.4–66.1
ELECTRIC UTILITIES		
Clerical workers without computers	0.5	0.2–2.0
Clerical workers with computers	1.2	0.5–4.5
Line workers	2.5	0.5–34.8
Electricians	5.4	0.8–34.0
Distribution substation operators	7.2	1.1–36.2
Workers off the job (home, travel, etc.)	0.9	0.3–3.7
TELECOMMUNICATIONS		
Install, maintenance, & repair technicians	1.5	0.7–3.2
Central office technicians	2.1	0.5–8.2
Cable splicers	3.2	0.7–15.0
AUTO TRANSMISSION MANUFACTURE		
Assemblers	0.7	0.2–4.9
Machinists	1.9	0.6–27.6
HOSPITALS		
Nurses	1.1	0.5–2.1
X-ray technicians	1.5	1.0–2.2
SELECTED OCCUPATIONS FROM ALL ECONOMIC SECTORS		
Construction machine operators	0.5	0.1–1.2
Motor vehicle drivers	1.1	0.4–2.7
School teachers	1.3	0.6–3.2
Auto mechanics	2.3	0.6–8.7
Retail sales	2.3	1.0–5.5
Sheet metal workers	3.9	0.3–48.4
Sewing machine operators	6.8	0.9–32.0
Forestry and logging jobs	7.6	0.6–95.5***

Source: National Institute for Occupational Safety and Health.
ELF (extremely low frequency)—frequencies 3–3,000 Hz.
* The median is the middle measurement in a sample arranged by size. These personal exposure measurements reflect the median magnitude of the magnetic field produced by the various EMF sources and the amount of time the worker spent in the fields.
** This range is between the 5th and 95th percentiles of the workday averages for an occupation.
*** Chain saw engines produce strong magnetic fields that are not pure 60-Hz fields.

the workplace. Different brands or models of the same type of equipment can have different magnetic field strengths. It is also important to keep in mind that the strength of a magnetic field decreases quickly with distance.

If you have questions or want more information about your EMF exposure at work, your plant safety officer, industrial hygienist, or other local safety official can be a good source of information. The National Institute for Occupational Safety and Health (NIOSH) is asked occasionally to conduct health hazard evaluations in workplaces where EMF is a suspected cause for concern. For further technical assistance contact NIOSH at 800-356-4674.

Q What are some typical sources of EMF in the workplace?

A Exposure assessment studies so far have shown that most people's EMF exposure at work comes from electrical appliances and tools and from the building's power supply. People who work near transformers, electrical closets, circuit boxes, or other high-current electrical equipment may have 60-Hz magnetic field exposures of hundreds of milligauss or more. In offices, magnetic field levels are often similar to those found at home, typically 0.5 to 4.0 mG. However, these levels can increase dramatically near certain types of equipment.

EMF Spot Measurements

Industry and sources	ELF magnetic fields (mG)	Other frequencies	Comments
ELECTRICAL EQUIPMENT USED IN MACHINE MANUFACTURING			
Electric resistance heater	6,000–14,000	VLF	
Induction heater	10–460	High VLF	
Hand-held grinder	3,000	–	Tool exposures measured at operator's chest.
Grinder	110	–	Tool exposures measured at operator's chest.
Lathe, drill press, etc.	1–4	–	Tool exposures measured at operator's chest.
ALUMINUM REFINING			
Aluminum pot rooms	3.4–30	Very high static field	Highly-rectified DC current (with an ELF ripple) refines aluminum.
Rectification room	300–3,300	High static field	
STEEL FOUNDRY			
Ladle refinery			
Furnace active	170–1,300	High ULF from the ladle's big magnetic stirrer	Highest ELF field was at the chair of control room operator.
Furnace inactive	0.6–3.7	High ULF from the ladle's big magnetic stirrer	Highest ELF field was at the chair of control room operator.
Electrogalvanizing unit	2–1,100	High VLF	
TELEVISION BROADCASTING			
Video cameras (studio and minicams)	7.2–24.0	VLF	
Video tape degaussers	160–3,300	–	Measured 1 ft away.
Light control centers	10–300	–	Walk-through survey.
Studio and newsrooms	2–5	–	Walk-through survey.
HOSPITALS			
Intensive care unit	0.1–220	VLF	Measured at nurse's chest.
Post-anesthesia care unit	0.1–24	VLF	
Magnetic resonance imaging (MRI)	0.5–280	Very high static field, VLF and RF	Measured at technician's work locations.
TRANSPORTATION			
Cars, minivans, and trucks	0.1–125	Most frequencies less than 60 Hz	Steel-belted tires are the principal ELF source for gas/diesel vehicles.
Bus (diesel powered)	0.5–146	Most frequencies less than 60 Hz	
Electric cars	0.1–81	Some elevated static fields	
Chargers for electric cars	4–63	–	Measured 2 ft from charger.
Electric buses	0.1–88	–	Measured at waist. Fields at ankles 2-5 times higher.
Electric train passenger cars	0.1–330	25 & 60 Hz power on U.S. trains	Measured at waist. Fields at ankles 2-5 times higher.
Airliner	0.8–24.2	400 Hz power on airliners	Measured at waist.
GOVERNMENT OFFICES			
Desk work locations	0.1–7	–	Peaks due to laser printers.
Desks near power center	18–50	–	
Power cables in floor	15–170	–	
Building power supplies	25–1,800	–	
Can opener	3,000	–	Appliance fields measured 6 in. away.
Desktop cooling fan	1,000	–	Appliance fields measured 6 in. away.
Other office appliances	10–200	–	

Source: National Institute for Occupational Safety and Health, 2001.
ULF (ultra low frequency)—frequencies above 0, below 3 Hz.
ELF (extremely low frequency)—frequencies 3–3,000 Hz.
VLF (very low frequency)—frequencies 3,000–30,000 Hz (3–30 kilohertz).

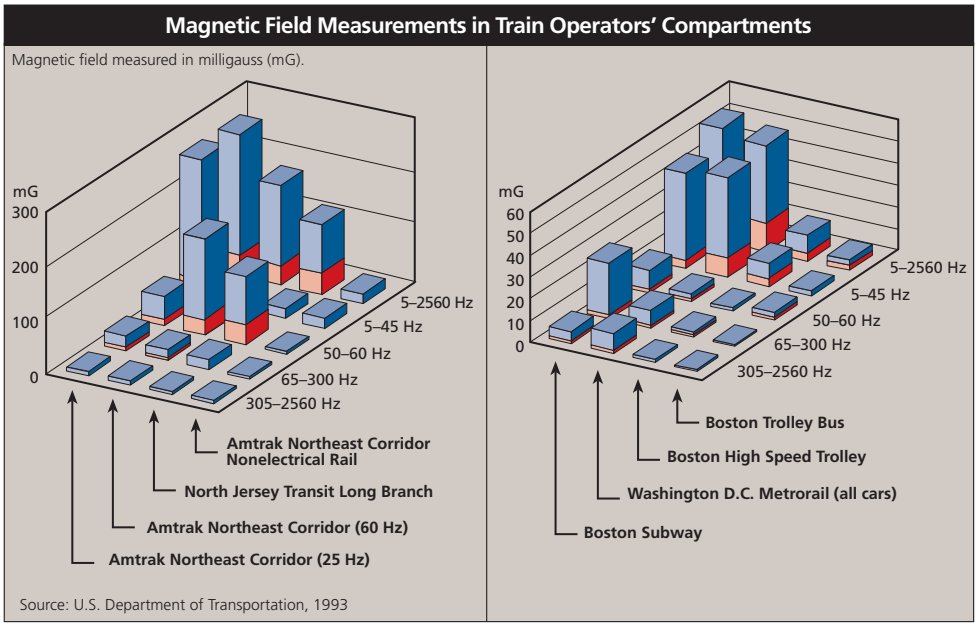
Q What EMF exposure occurs during travel?

A Inside a car or bus, the main sources of magnetic field exposure are those you pass by (or under) as you drive, such as power lines. Car batteries involve direct current (DC) rather than alternating current (AC). Alternators can create EMF, but at frequencies other than 60 Hz. The rotation of steel-belted tires is also a source of EMF.

Most trains in the United States are diesel powered. Some electrically powered trains operate on AC, such as the passenger trains between Washington, D.C. and New Haven, Connecticut. Measurements taken on these trains using personal exposure monitors have suggested that average 60-Hz magnetic field exposures for passengers and conductors may exceed 50 mG. A U.S. government-sponsored exposure assessment study of electric rail systems found average 60-Hz magnetic field levels in train operator compartments that ranged from 0.4 mG (Boston high speed trolley) to 31.1 mG (North Jersey transit). The graph on the next page shows average and maximum magnetic field measurements in operator compartments of several electric rail systems. It illustrates that 60 Hz is one of several electromagnetic frequencies to which train operators are exposed.

Workers who maintain the tracks on electric rail lines, primarily in the northeastern United States, also have elevated magnetic field exposures at both 25 Hz and 60 Hz. Measurements taken by the National Institute for Occupational Safety and Health show that typical average daily exposures range from 3 to 18 mG, depending on how often trains pass the work site.

Rapid transit and light rail systems in the United States, such as the Washington D.C. Metro and the San Francisco Bay Area Rapid Transit, run on DC electricity. These DC-powered trains contain equipment that produces AC fields. For example, areas of strong AC magnetic fields have been measured on the Washington Metro close to the floor, during braking and acceleration, presumably near equipment located underneath the subway cars.



These graphs illustrate that 60 Hz is one of several electromagnetic frequencies to which train operators are exposed. The maximum exposure is the top of the blue (upper) portion of the bar; the average exposure is the top of the red (lower) portion.

Q How can I find out how strong the EMF is where I live and work?

A The tables throughout this chapter can give you a general idea about magnetic field levels at home, for different jobs, and around various kinds of electrical equipment. For specific information about EMF from a particular power line, contact the utility that operates the line. Some will perform home EMF measurements.

You can take your own EMF measurements with a magnetic field meter. For a spot measurement to provide a useful estimate of your EMF exposure, it should be taken at a time of day and location when and where you are typically near the equipment. Keep in mind that the strength of a magnetic field drops off quickly with distance.

Independent technicians will conduct EMF measurements for a fee. Search the Internet under "EMF meters" or "EMF measurement." You should investigate the experience and qualifications of commercial firms, since governments do not standardize EMF measurements or certify measurement contractors.

At work, your plant safety officer, industrial hygienist, or other local safety official can be a good source of information. The National Institute for Occupational Safety and Health (NIOSH) sometimes conducts health hazard evaluations in workplaces where EMF is a suspected cause for concern. For further technical assistance, contact NIOSH at 800-356-4674.

Q How much do computers contribute to my EMF exposure?

A Personal computers themselves produce very little EMF. However, the video display terminal (VDT) or monitor provides some magnetic field exposure unless it is of the new flat-panel design. Conventional VDTs containing cathode ray tubes use magnetic fields to produce the image on the screen, and some emission of those magnetic fields is unavoidable. Unlike most other appliances which produce predominantly 60-Hz magnetic fields, VDTs emit magnetic fields in both the extremely low frequency (ELF) and very low frequency (VLF) frequency ranges (see page 8). Many newer VDTs have been designed to minimize magnetic field emissions, and those identified as "TCO'99 compliant" meet a standard for low emissions (see page 48).

Q What can be done to limit EMF exposure?

A Personal exposure to EMF depends on three things: the strength of the magnetic field sources in your environment, your distance from those sources, and the time you spend in the field.

If you are concerned about EMF exposure, your first step should be to find out where the major EMF sources are and move away from them or limit the time you spend near them. Magnetic fields from appliances decrease dramatically about an arm's length away from the source. In many cases, rearranging a bed, a chair, or a work area to increase your distance from an electrical panel or some other EMF source can reduce your EMF exposure.

Another way to reduce EMF exposure is to use equipment designed to have relatively low EMF emissions. Sometimes electrical wiring in a house or a building can be the source of strong magnetic field exposure. Incorrect wiring is a common source of higher-than-usual magnetic fields. Wiring problems are also worth correcting for safety reasons.

In its 1999 report to Congress, the National Institute of Environmental Health Sciences suggested that the power industry continue its current practice of siting power lines to reduce EMF exposures.

There are more costly actions, such as burying power lines, moving out of a home, or restricting the use of office space that may reduce exposures. Because scientists are still debating whether EMF is a hazard to health, it is not clear that the costs of such measures are warranted. Some EMF reduction measures may create other problems. For instance, compacting power lines reduces EMF but increases the danger of accidental electrocution for line workers.

We are not sure which aspects of the magnetic field exposure, if any, to reduce. Future research may reveal that EMF reduction measures based on today's limited understanding are inadequate or irrelevant. No action should be taken to reduce EMF exposure if it increases the risk of a known safety hazard.

5 EMF Exposure Standards

This chapter describes standards and guidelines established by state, national, and international safety organizations for some EMF sources and exposures.

Q Are there exposure standards for 60-Hz EMF?

A In the United States, there are no federal standards limiting occupational or residential exposure to 60-Hz EMF.

At least six states have set standards for transmission line electric fields; two of these also have standards for magnetic fields (see table below). In most cases, the maximum fields permitted by each state are the maximum fields that existing lines produce at maximum load-carrying conditions. Some states further limit electric field strength at road crossings to ensure that electric current induced into large metal objects such as trucks and buses does not represent an electric shock hazard.

State Transmission Line Standards and Guidelines

	Electric Field		Magnetic Field	
State	On R.O.W.*	Edge R.O.W.	On R.O.W.	Edge R.O.W.
Florida	8 kV/m[a] 10 kV/m[b]	2 kV/m	—	150 mG[a] (max. load) 200 mG[b] (max. load) 250 mG[c] (max. load)
Minnesota	8 kV/m	—	—	—
Montana	7 kV/m[d]	1 kV/m[e]		
New Jersey	—	3 kV/m		
New York	11.8 kV/m 11.0 kV/m[f] 7.0 kV/m[d]	1.6 kV/m	—	200 mG (max. load)
Oregon	9 kV/m	—	—	—

*R.O.W. = right-of-way (or in the Florida standard, certain additional areas adjoining the right-of-way). kV/m = kilovolt per meter. One kilovolt = 1,000 volts. [a]For lines of 69-230 kV. [b]For 500 kV lines. [c]For 500 kV lines on certain existing R.O.W. [d]Maximum for highway crossings. [e]May be waived by the landowner. [f]Maximum for private road crossings.

Two organizations have developed voluntary occupational exposure guidelines for EMF exposure. These guidelines are intended to prevent effects, such as induced currents in cells or nerve stimulation, which are known to occur at high magnitudes, much higher (more than 1,000 times higher) than EMF levels found typically in

occupational and residential environments. These guidelines are summarized in the tables on the right.

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) concluded that available data regarding potential long-term effects, such as increased risk of cancer, are insufficient to provide a basis for setting exposure restrictions.

ICNIRP Guidelines for EMF Exposure

Exposure (60 Hz)	Electric field	Magnetic field
Occupational	8.3 kV/m	4.2 G (4,200 mG)
General Public	4.2 kV/m	0.833 G (833 mG)

International Commission on Non-Ionizing Radiation Protection (ICNIRP) is an organization of 15,000 scientists from 40 nations who specialize in radiation protection.
Source: ICNIRP, 1998.

The American Conference of Governmental Industrial Hygienists (ACGIH) publishes "Threshold Limit Values" (TLVs) for various physical agents. The TLVs for 60-Hz EMF shown in the table are identified as guides to control exposure; they are not intended to demarcate safe and dangerous levels.

ACGIH Occupational Threshold Limit Values for 60-Hz EMF

	Electric field	Magnetic field
Occupational exposure should not exceed	25 kV/m	10 G (10,000 mG)
Prudence dictates the use of protective clothing above	15 kV/m	–
Exposure of workers with cardiac pacemakers should not exceed	1 kV/m	1 G (1,000 mG)

American Conference of Governmental Industrial Hygienists (ACGIH) is a professional organization that facilitates the exchange of technical information about worker health protection. It is not a government regulatory agency.
Source: ACGIH, 2001.

Q Does EMF affect people with pacemakers or other medical devices?

A According to the U.S. Food and Drug Administration (FDA), interference from EMF can affect various medical devices including cardiac pacemakers and implantable defibrillators. Most current research in this area focuses on higher frequency sources such as cellular phones, citizens band radios, wireless computer links, microwave signals, radio and television transmitters, and paging transmitters.

Sources such as welding equipment, power lines at electric generating plants, and rail transportation equipment can produce lower frequency EMF strong enough to interfere with some models of pacemakers and defibrillators. The occupational exposure guidelines developed by ACGIH state that workers with cardiac pacemakers should not be exposed to a 60-Hz magnetic field greater than 1 gauss (1,000 mG) or a 60-Hz electric field greater than 1 kilovolt per meter (1,000 V/m) (see ACGIH guidelines above). Workers who are concerned about EMF exposure effects on pacemakers, implantable defibrillators, or other implanted electronic medical devices should consult their doctors or industrial hygienists.

Nonelectronic metallic medical implants (such as artificial joints, pins, nails, screws, and plates) can be affected by high magnetic fields such as those from magnetic resonance imaging (MRI) devices and aluminum refining equipment, but are generally unaffected by the lower fields from most other sources.

The FDA MedWatch program is collecting information about medical device problems thought to be associated with exposure to or interference from EMF. Anyone experiencing a problem that might be due to such interference is encouraged to call and report it (800-332-1088).

Q What about products advertised as producing low or reduced magnetic fields?

A Virtually all electrical appliances and devices emit electric and magnetic fields. The strengths of the fields vary appreciably both between types of devices and among manufacturers and models of the same type of device. Some appliance manufacturers are designing new models that, in general, have lower EMF than older models. As a result, the words "low field" or "reduced field" may be relative to older models and not necessarily relative to other manufacturers or devices. At this time, there are no domestic or international standards or guidelines limiting the EMF emissions of appliances.

The U.S. government has set no standards for magnetic fields from computer monitors or video display terminals (VDTs). The Swedish Confederation of Professional Employees (TCO) established in 1992 a standard recommending strict limits on the EMF emissions of computer monitors. The VDTs should produce magnetic fields of no more than 2 mG at a distance of 30 cm (about 1 ft) from the front surface of the monitor and 50 cm (about 1 ft 8 in) from the sides and back of the monitor. The TCO'92 standard has become a *de facto* standard in the VDT industry worldwide. A 1999 standard, promulgated by the Swedish TCO (known as the TCO'99 standard), provides for international and environmental labeling of personal computers. Many computer monitors marketed in the U.S. are certified as compliant with TCO'99 and are thereby assured to produce low magnetic fields.

Beware of advertisements claiming that the federal government has certified that the advertised equipment produces little or no EMF. The federal government has no such general certification program for the emissions of low-frequency EMF. The U.S. Food and Drug Administration's Center for Devices and Radiological Health (CDRH) does certify medical equipment and equipment producing high levels of ionizing radiation or microwave radiation. Information about certain devices as well as general information about EMF is available from the CDRH at 888-463-6332.

Q Are cellular telephones and towers sources of EMF exposure?

A Cellular telephones and towers involve radio-frequency and microwave-frequency electromagnetic fields (see page 8). These are in a much higher frequency range than are the power-frequency electric and magnetic fields associated with the transmission and use of electricity.

The U.S. Federal Communications Commission (FCC) licenses communications systems that use radio-frequency and microwave electromagnetic fields and ensures that licensed facilities comply with exposure standards. Public information on this topic is published on two FCC Internet sites: http://www.fcc.gov/oet/info/documents/bulletins/#56 and http://www.fcc.gov/oet/rfsafety/

The U.S. Food and Drug Administration also provides information about cellular telephones on its web site (http://www.fda.gov/cdrh/ocd/mobilphone.html).

6 National and International EMF Reviews

This chapter presents the findings and recommendations of major EMF research reviews, including the U.S. government's EMF RAPID Program.

Q What have national and international agencies concluded about the impact of EMF exposure on human health?

A Since 1995, two major U.S. reports have concluded that limited evidence exists for an association between EMF exposure and increased leukemia risk, but that when all the scientific evidence is considered, the link between EMF exposure and cancer is weak. The World Health Organization in 1997 reached a similar conclusion.

The two reports were the U.S. National Academy of Sciences report in 1996 and, in 1999, the National Institute of Environmental Health Sciences report to the U.S. Congress at the end of the U.S. EMF Research and Public Information Dissemination (RAPID) Program.

The U.S. EMF RAPID Program

Initiated by the U.S. Congress and established by law in 1992, the U.S. EMF Research and Public Information Dissemination (EMF RAPID) Program set out to study whether exposure to electric and magnetic fields produced by the generation, transmission, or use of electric power posed a risk to human health. For more information about the EMF RAPID Program, visit the web site (http://www.niehs.nih.gov/emfrapid).

The U.S. Department of Energy (DOE) administered the overall EMF RAPID Program, but health effects research and risk assessment were supervised by the National Institute of Environmental Health Sciences (NIEHS), a branch of the U.S. National Institutes of Health (NIH). Together, DOE and NIEHS oversaw more than 100 cellular and animal studies, as well as engineering and exposure assessment studies. Although the EMF RAPID Program did not fund any additional epidemiological studies, an analysis of the many studies already conducted was an important part of its final report.

The electric power industry contributed about half, or $22.5 million, of the $45 million eventually spent on EMF research over the course of the EMF RAPID Program. The NIEHS received $30.1 million from this program for research, public outreach, administration, and the health assessment evaluation of extremely low frequency (ELF) EMF. The DOE received approximately $15 million from this program for engineering and EMF mitigation research. The NIEHS contributed an additional $14.5 million for support of extramural and intramural research including long-term toxicity and carcinogenicity studies conducted by the National Toxicology Program.

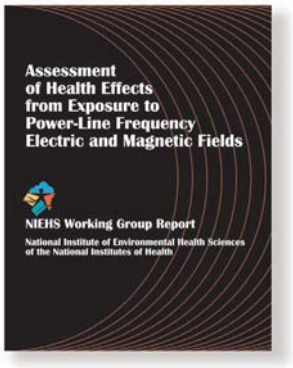
EMF RAPID Program Interagency Committee

- National Institute of Environmental Health Sciences
- Department of Energy
- Department of Defense
- Department of Transportation
- Environmental Protection Agency
- Federal Energy Regulatory Commission
- National Institute of Standards and Technology
- Occupational Safety and Health Administration
- Rural Electrification Administration

An interagency committee was established by the President of the United States to provide oversight and program management support for the EMF RAPID Program. The interagency committee included representatives from NIEHS, DOE, and seven other federal agencies with EMF-related responsibilities.

The EMF RAPID Program also received advice from a National EMF Advisory Committee (NEMFAC), which included representatives from citizen groups, labor, utilities, the National Academy of Sciences, and other groups. They met regularly with DOE and NIEHS staff to express their views. NEMFAC meetings were open to the public. The EMF RAPID Program sponsored citizen participation in some scientific meetings as well. A broad group of citizens reviewed all major public information materials produced for the program.

NIEHS Working Group Report 1998



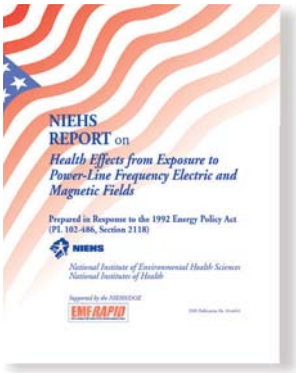
In preparation for the EMF RAPID Program's goal of reporting to the U.S. Congress on possible health effects from exposure to EMF from power lines, the NIEHS convened an expert working group in June 1998. Over 9 days, about 30 scientists conducted a complete review of EMF studies, including those sponsored by the EMF RAPID Program and others. Their conclusions offered guidance to the NIEHS as it prepared its report to Congress.

Using criteria developed by the International Agency for Research on Cancer, a majority of the members of the working group concluded that exposure to power-frequency EMF is a possible human carcinogen.

The majority called their opinion "a conservative public health decision based on limited evidence for an increased occurrence of childhood leukemias and an increased occurrence of chronic lymphocytic leukemia (CLL) in occupational settings." For these

diseases, the working group reported that animal and cellular studies neither confirm nor deny the epidemiological studies' suggestion of a disease risk. This report is available on the NIEHS EMF RAPID web site (http://www.niehs.nih.gov/emfrapid).

NIEHS Report to Congress at Conclusion of EMF RAPID Program



In June 1999, the NIEHS reported to the U.S. Congress that scientific evidence for an EMF-cancer link is weak.

The following are excerpts from the 1999 NIEHS report:

> The NIEHS believes that the probability that ELF-EMF exposure is truly a health hazard is currently small. The weak epidemiological associations and lack of any laboratory support for these associations provide only marginal, scientific support that exposure to this agent is causing any degree of harm.
>
> The scientific evidence suggesting that extremely low frequency EMF exposures pose any health risk is weak. The strongest evidence for health effects comes from associations observed in human populations with two forms of cancer: childhood leukemia and chronic lymphocytic leukemia in occupationally exposed adults. While the support from individual studies is weak, the epidemiological studies demonstrate, for some methods of measuring exposure, a fairly consistent pattern of a small, increased risk with increasing exposure that is somewhat weaker for chronic lymphocytic leukemia than for childhood leukemia. In contrast, the mechanistic studies and the animal toxicology literature fail to demonstrate any consistent pattern across studies, although sporadic findings of biological effects (including increased cancers in animals) have been reported. No indication of increased leukemias in experimental animals has been observed.

The full report is available on the NIEHS EMF RAPID web site (http://www.niehs.nih.gov/emfrapid).

No regulatory action was recommended or taken based on the NIEHS report. The NIEHS director, Dr. Kenneth Olden, told the Congress that, in his opinion, the conclusion of the NIEHS report was not sufficient to warrant aggressive regulatory action.

The NIEHS did not recommend adopting EMF standards for electric appliances or burying electric power lines. Instead, it recommended providing public information about practical ways to reduce EMF exposure. The NIEHS also suggested that power companies and utilities "continue siting power lines to reduce exposures and . . . explore ways to reduce the creation of magnetic fields around transmission and distribution lines without creating new hazards." The NIEHS encouraged manufacturers to reduce magnetic fields at a minimal cost, but noted that the risks do not warrant expensive redesign of electrical appliances.

The NIEHS also encouraged individuals who are concerned about EMF in their homes to check to see if their homes are properly wired and grounded, since incorrect wiring or other code violations are a common source of higher-than-usual magnetic fields.

National Academy of Sciences Report

In October 1996, a National Research Council committee of the National Academy of Sciences (NAS) released its evaluation of research on potential associations between EMF exposure and cancer, reproduction, development, learning, and behavior. The report concluded:

> Based on a comprehensive evaluation of published studies relating to the effects of power-frequency electric and magnetic fields on cells, tissues, and organisms (including humans), the conclusion of the committee is that the current body of evidence does not show that exposure to these fields presents a human-health hazard. Specifically, no conclusive and consistent evidence shows that exposures to residential electric and magnetic fields produce cancer, adverse neurobehavioral effects, or reproductive and developmental effects.

The NAS report focused primarily on the association of childhood leukemia with the proximity of the child's home to power lines. The NAS panel found that although a link between EMF exposure and increased risk for childhood leukemia was observed in studies that had estimated EMF exposure using the wire code method (distance of home from power line), such a link was not found in studies that had included actual measurements of magnetic fields at the time of the study. The panel called for more research to pinpoint the unexplained factors causing small increases in childhood leukemia in houses close to power lines.

World Health Organization International EMF Project

The World Health Organization (WHO) International EMF Project, with headquarters in Geneva, Switzerland, was launched at a 1996 meeting with representatives of 23 countries attending. It was intended to respond to growing concerns in many member states over possible EMF health effects and to address the conflict between such concerns and technological and economic progress. In its advisory role, the WHO International EMF Project is now reviewing laboratory and epidemiological evidence, identifying gaps in scientific knowledge, developing an agenda for future research, and developing risk communication booklets and other public information. The WHO International EMF Project is funded with contributions from governments and institutions and is expected to provide an overall EMF health risk assessment. Additional information about this program can be found on the WHO EMF web site (http://www.who.int/peh-emf).

As part of this project, in 1997 a working group of 45 scientists from around the world surveyed the evidence for adverse

EMF health effects. They reported that, "taken together, the findings of all published studies are suggestive of an association between childhood leukemia and estimates of ELF (extremely low frequency or power-frequency) magnetic fields."

Much like the 1996 U.S. NAS report, the WHO report noted that living in homes near power lines was associated with an approximate 1.5-fold excess risk of childhood leukemia. But unlike the NAS panel, WHO scientists had seen the results of the 1997 U.S. National Cancer Institute study of EMF and childhood leukemia (see page 17). This work showed even more strongly the inconsistency between results of studies that used a wire code to estimate EMF exposure and studies that actually measured magnetic fields.

Regarding health effects other than cancer, the WHO scientists reported that the epidemiological studies "do not provide sufficient evidence to support an association between extremely-low-frequency magnetic-field exposure and adult cancers, pregnancy outcome, or neurobehavioural disorders."

World Health Organization International Agency for Research on Cancer

The WHO International Agency for Research on Cancer (IARC) produces a monograph series that reviews the scientific evidence regarding potential carcinogenicity associated with exposure to environmental agents. An international scientific panel of 21 experts from 10 countries met in June 2001 to review the scientific evidence regarding the potential carcinogenicity of static and ELF (extremely low frequency or power-frequency) EMF. The panel categorized its conclusions for carcinogenicity based on the IARC classification system—a system that evaluates the strength of evidence from epidemiological, laboratory (human and cellular), and mechanistic studies. The panel classified power-frequency EMF as "possibly carcinogenic to humans" based on a fairly consistent statistical association between a doubling of risk of childhood leukemia and magnetic field exposure above 0.4 microtesla (0.4 µT, 4 milligauss or 4 mG).

In contrast, they found no consistent evidence that childhood EMF exposures are associated with other types of cancer or that adult EMF exposures are associated with increased risk for any kind of cancer. The IARC panel reported that no consistent carcinogenic effects of EMF exposure have been observed in experimental animals and that there is currently no scientific explanation for the observed association between childhood leukemia and EMF exposure. Further information can be obtained at the IARC web sites (http://www.iarc.fr and http://monographs.iarc.fr).

International Commission on Non-Ionizing Radiation Protection

The International Commission on Non-Ionizing Radiation Protection (ICNIRP) issued exposure guidelines to guard against known adverse effects such as stimulation of nerves and muscles at very high EMF levels, as well as shocks and burns caused by touching objects that conduct electricity (see page 47). In April 1998, ICNIRP revised its exposure guidelines and characterized as "unconvincing" the evidence for an association between everyday power-frequency EMF and cancer.

European Union

In 1996, a European Union (EU) advisory panel provided an overview of the state of science and standards among EU countries. With respect to power-frequency EMF, the panel members said that there is no clear evidence that exposure to EMF results in an increased risk of cancer.

Australia—Radiation Advisory Committee Report to Parliament

In 1997, Australia's Radiation Advisory Committee briefly reviewed the EMF scientific literature and advised the Australian Parliament that, overall, there is insufficient evidence to come to a firm conclusion regarding possible health effects from exposure to power-frequency magnetic fields.

The committee also reported that "the weight of opinion as expressed in the U.S. National Academy of Sciences report, and the negative results from the National Cancer Institute study (Linet et al., 1997) would seem to shift the balance of probability more towards there being no identifiable health effects" (see pages 17 and 53).

Canada—Health Canada Report

In December 1998, a working group of public health officers at Health Canada, the federal agency that manages Canada's health care system, issued a review of the scientific literature regarding power-frequency EMF health effects. They found the evidence to be insufficient to conclude that EMF causes a risk of cancer.

The report concluded that while EMF effects may be observed in biological systems in a laboratory, no adverse health effects have been demonstrated at the levels to which humans and animals are typically exposed.

As for epidemiology, 25 years of study results are inconsistent and inconclusive, the panel said, and a plausible EMF-cancer mechanism is missing. Health Canada pledged to continue monitoring EMF research and to reassess this position as new information becomes available.

Germany—Ordinance 26

On January 1, 1997, Germany became the first nation to adopt a national rule on EMF exposure for the general public. Ordinance 26 applies only to facilities such as overhead and underground transmission and distribution lines, transformers, switchgear and overhead lines for electric-powered trains. Both electric (5 kV/m) and magnetic field exposure limits (1 Gauss) are high enough that they are unlikely to be encountered in ordinary daily life. The ordinance also requires that precautionary measures be taken on a case-by-case basis when electric facilities are sited or upgraded near homes, hospital, schools, day care centers, and playgrounds.

Great Britain—National Radiological Protection Board Report

The National Radiological Protection Board (NRPB) in Great Britain advises the government of the United Kingdom regarding standards of protection for exposure to non-ionizing radiation. The NRPB's advisory group on non-ionizing radiation periodically reviews new developments in EMF research and reports its findings. Results of the advisory group's latest review were published in 2001. The report reviewed residential and occupational epidemiological studies, as well as cellular, animal, and human volunteer studies that had been published.

The advisory group noted that there is "some epidemiological evidence that prolonged exposure to higher levels of power frequency magnetic fields is associated with a small risk of leukaemia in children." Specifically, the NRPB advisory group's analysis suggests "that relatively heavy average exposures of 0.4 µT [4 mG] or more are associated with a doubling of the risk of leukaemia in children under 15 years of age." The group pointed out, however, that laboratory experiments have provided "no good evidence that extremely low frequency electromagnetic fields are capable of producing cancer."

Scandinavia—EMF Developments

In October 1995, a group of Swedish researchers and government officials published a report about EMF exposure in the workplace. This "Criteria Group" reviewed EMF scientific literature and, using the IARC classification system, ranked occupational EMF exposure as "possibly carcinogenic to humans." They also endorsed the Swedish government's 1994 policy statement that public exposure limits to EMFs were not needed, but that people might simply want to use caution with EMFs.

In 1996, five Swedish government agencies further explained their precautionary advice about EMF. EMF exposure should be reduced, they said, but only when practical, without great inconvenience or cost.

Health experts in Norway, Denmark, and Finland generally agreed in reviews published in the 1990s that if an EMF health risk exists, it is small. They acknowledged that a link between residential magnetic fields and childhood leukemia cannot be confirmed or denied. In 1994, several Norwegian government ministries also recommended increasing the distance between residences and electrical facilities, if it could be done at low cost and with little inconvenience.

Q What other U.S. organizations have reported on EMF?

A

American Medical Association

In 1995, the American Medical Association advised physicians that no scientifically documented health risk had been associated with "usually occurring" EMF, based on a review of EMF epidemiological, laboratory studies, and major literature reviews.

American Cancer Society

In 1996, the American Cancer Society released a review of 20 years of EMF epidemiological research including occupational studies and residential studies of

adult and childhood cancer. The society noted that some data support a possible relationship of magnetic field exposure with leukemia and brain cancer, but further research may not be justified if studies continue to find uncertain results. Of particular interest is the summary of results from eight studies of risk from use of household appliances with relatively high magnetic fields, such as electric blankets and electric razors. The summary suggested that there is no persuasive evidence for increased risk with more frequent or longer use of these appliances.

American Physical Society

The American Physical Society (APS) represents thousands of U.S. physicists. Responding to the NIEHS Working Group's conclusion that EMF is a possible human carcinogen, the APS executive board voted in 1998 to reaffirm its 1995 opinion that there is "no consistent, significant link between cancer and power line fields."

California's Department of Health Services

In 1996, California's Department of Health Services (DHS) began an ambitious five-year effort to assess possible EMF public health risk and offer guidance to school administrators and other decision-makers. The California Electric and Magnetic Fields (EMF) Program is a research, education, and technical assistance program concerned with the possible health effects of EMF from power lines, appliances, and other uses of electricity. The program's goal is to find a rational and fair approach to dealing with the potential risks, if any, of exposure to EMF. This is done through research, policy analysis, and education. The web site has educational materials on EMF and related health issues for individuals, schools, government agencies, and professional organizations (http://www.dhs.ca.gov/ps/deodc/ehib/emf).

Q What can we conclude about EMF at this time?

A Electricity is a beneficial part of our daily lives, but whenever electricity is generated, transmitted, or used, electric and magnetic fields are created. Over the past 25 years, research has addressed the question of whether exposure to power-frequency EMF might adversely affect human health. For most health outcomes, there is no evidence that EMF exposures have adverse effects. There is some evidence from epidemiology studies that exposure to power-frequency EMF is associated with an increased risk for childhood leukemia. This association is difficult to interpret in the absence of reproducible laboratory evidence or a scientific explanation that links magnetic fields with childhood leukemia.

EMF exposures are complex and come from multiple sources in the home and workplace in addition to power lines. Although scientists are still debating whether EMF is a hazard to health, the NIEHS recommends continued education on ways of reducing exposures. This booklet has identified some EMF sources and some simple steps you can take to limit your exposure. For your own safety, it is important that any steps you take to reduce your exposures do not increase other obvious hazards such as those from electrocution or fire. At the current time in the United States, there are no federal standards for occupational or residential exposure to 60-Hz EMF.

7 References

Selected references on EMF topics.

Basic Science

Kovetz A. Electromagnetic Theory. New York: Oxford University Press (2000).

Vanderlinde J. Classical Electromagnetic Theory. New York: Wiley (1993).

EMF Levels and Exposures

Dietrich FM & Jacobs WL. Survey and Assessment of Electric and Magnetic (EMF) Public Exposure in the Transportation Environment. Report of the U. S. Department of Transportation. NTIS Document PB99-130908. Arlington, VA: National Technical Information Service (1999).

Kaune WT. Assessing human exposure to power-frequency electric and magnetic fields. Environmental Health Perspectives 101:121-133 (1993).

Kaune WT & Zaffanella L. Assessing historical exposure of children to power frequency magnetic fields. Journal of Exposure Analysis Environmental Epidemiology 4:149-170 (1994).

Tarone RE, Kaune WT, Linet MS, Hatch EE, Kleinerman RA, Robison LL, Boice JD & Wacholder S. Residential wire codes: Reproducibility and relation with measured magnetic fields. Occupational and Environmental Medicine 55:333-339 (1998).

U.S. Environmental Protection Agency. EMF in your environment: magnetic field measurements of everyday electrical devices. Washington, DC: Office of Radiation and Indoor Air, Radiation Studies Division, U.S. Environmental Protection Agency, Report No. 402-R-92-008 (1992).

Zaffanella L. Survey of residential magnetic field sources. Volume 1: Goals, Results and Conclusions. EPRI Report No. TR-102759. Palo Alto, CA:Electric Power Research Institute (EPRI), 1993;1-224.

EMF Standards and Regulations

Documentation of the Threshold Limit Values and Biological Exposure Indices, 7th Ed. Publication No. 0100. Cincinnati, OH: American Conference of Governmental Industrial Hygienists (2001).

ICNIRP International Commission on Non-Ionizing Radiation Protection. Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields (up to 300 GHz). Health Physics 74:494-522 (1998).

Swedish National Board of Occupational Safety and Health. Low-Frequency Electrical and Magnetic Fields (SNBOSH): The Precautionary Principle for National Authorities. Guidance for Decision-Makers. Solna (1996).

U.S. Department of Transportation, F.R.A. Safety of High Speed Guided Ground Transportation Systems, Magnetic and Electric Field Testing of the Amtrak Northeast Corridor and New Jersey Coast Line Rail Systems, Volume I: Analysis. Washington, DC: Office of Research and Development (1993).

Residential Childhood Cancer Studies

Ahlbom A, Day N, Feychting M, Roman E, Skinner J, Dockerty J, Linet M, McBride M, Michaelis J, Olsen JH, Tynes T & Verkasalo PK. A pooled analysis of magnetic fields and childhood leukemia. British Journal of Cancer 83:692-698 (2000).

Coghill RW, Steward J & Philips A. Extra low frequency electric and magnetic fields in the bedplace of children diagnosed with leukemia: A case-control study. European Journal of Cancer Prevention 5:153-158 (1996).

Dockerty JD, Elwood JM, Skegg DC, & Herbison GP. Electromagnetic field exposures and childhood cancers in New Zealand. Cancer Causes and Control 9:299-309 (1998).

Feychting M & Ahlbom A. Magnetic fields and cancer in children residing near Swedish high-voltage power lines. American Journal of Epidemiology 138:467-481 (1993).

Greenland S, Sheppard AR, Kaune WT, Poole C & Kelsh MA. A pooled analysis of magnetic fields, wire codes and childhood leukemia. EMF Study Group. Epidemiology 11:624-634 (2000).

Linet MS, Hatch EE, Kleinerman RA, Robison LL, Kaune WT, Friedman DR, Severson RK, Haines CM, Hartsock CT, Niwa S, Wacholder S & Tarone RE. Residential exposure to magnetic fields and acute lymphoblastic leukemia in children. New England Journal of Medicine 337:1-7 (1997).

London SJ, Thomas DC, Bowman JD, Sobel E, Cheng TC & Peters JM. Exposure to residential electric and magnetic fields and risk of childhood leukemia. American Journal of Epidemiology 134:923-937 (1991).

McBride ML, Gallagher RP, Thériault G, Armstrong BG, Tamaro S, Spinelli JJ, Deadman JE, Fincham B, Robson D & Choi W. Power-frequency electric and magnetic fields and risk of childhood leukemia in Canada. American Journal of Epidemiology 149:831-842 (1999).

Michaelis J, Schuz J, Meinert R, Zemann E, Grigat JP, Kaatsch P, Kaletsch U, Miesner A, Brinkmann K, Kalkner W, & Karner H. Combined risk estimates for two German population-based case-control studies on residential magnetic fields and childhood leukemia. Epidemiology 9:92-94 (1998).

Olsen JH, Nielsen A & Schulgen G. Residence near high voltage facilities and risk of cancer in children. British Medical Journal 307:891-895 (1993).

Savitz DA, Wachtel H, Barnes FA, John EM & Tvrdik JG. Case-control study of childhood cancer and exposure to 60-Hz magnetic fields. American Journal of Epidemiology 128:21-38 (1988).

Tomenius L. 50-Hz electromagnetic environment and the incidence of childhood tumors in Stockholm county. Bioelectromagnetics 7:191-207 (1986).

Tynes T & Haldorsen T. Electromagnetic fields and cancer in children residing near Norwegian high-voltage power lines. American Journal of Epidemiology 145:219-226 (1997).

UK Childhood Cancer Study Investigators. Exposure to power frequency magnetic fields and the risk of childhood cancer: a case/control study. Lancet 354:1925-1931 (1999).

Verkasalo PK, Pukkala E, Hongisto MY, Valjus JE, Jarvinen PJ, Heikkila KV & Koskenvuo M. Risk of cancer in Finnish children living close to power lines. British Medical Journal 307:895-899 (1993).

Residential Adult Cancer Studies

Coleman MP, Bell CM, Taylor HL & Primie-Zakelj M. Leukemia and residence near electricity transmission equipment: a case-control study. British Journal of Cancer 60:793-798 (1989).

Feychting M & Ahlbom A. Magnetic fields, leukemia, and central nervous system tumors in Swedish adults residing near high-voltage power lines. Epidemiology 5:501-509 (1994).

Li CY, Theriault G & Lin RS. Residential exposure to 60-hertz magnetic fields and adult cancers in Taiwan. Epidemiology 8:25-30 (1997).

McDowall ME. Mortality of persons resident in the vicinity of electricity transmission facilities. British Journal of Cancer 53:271-279 (1986).

Severson RK, Stevens RG, Kaune WT, Thomas DB, Heuser L, Davis S & Sever LE. Acute nonlymphocytic leukemia and residential exposure to power frequency magnetic fields. American Journal of Epidemiology 128:10-20 (1988).

Wrensch M, Yost M, Miike R, Lee G & Touchstone J. Adult glioma in relation to residential power-frequency electromagnetic field exposures in the San Francisco Bay area. Epidemiology 10:523-527 (1999).

Youngson JH, Clayden AD, Myers A & Cartwright RA. A case/control study of adult haematological malignancies in relation to overhead powerlines. British Journal of Cancer 63:977-985 (1991).

Occupational EMF Cancer Studies

Coogan PF, Clapp RW, Newcomb PA, Wenzl TB, Bogdan G, Mittendorf R, Baron JA & Longnecker MP. Occupational exposure to 60-Hertz magnetic fields and risk of breast cancer in women. Epidemiology 7:459-464 (1996).

Floderus B, Persson T, Stenlund C, Wennberg A, Ost A, & Knave B. Occupational exposure to electromagnetic fields in relation to leukemia and brain tumors: a case-control study in Sweden. Cancer Causes Control 4:465-476 (1993).

Floderus B, Tornqvist S, & Stenlund C. Incidence of selected cancers in Swedish railway workers, 1961-79. Cancer Causes Control 5:189-194 (1994).

Sorahan T, Nichols L, van Tongeren M, & Harrington JM. Occupational exposure to magnetic fields relative to mortality from brain tumours: updated and revised findings from a study of United Kingdom electricity generation and transmission workers, 1973–97. Occupational and Environmental Medicine 58(10):626-630 (2001).

Johansen C, & Olsen JH Risk of cancer among Danish utility workers - A nationwide cohort study. American Journal of Epidemiology, 147:548-555 (1998).

Kheifets LI, Gilbert ES, Sussman SS, Guenel P, Sahl JD, Savitz DA, & Theriault G. Comparative analyses of the studies of magnetic fields and cancer in electric utility workers: studies from France, Canada, and the United States. Occupational and Environmental Medicine 56(8):567-574 (1999).

London SJ, Bowman JD, Sobel E, Thomas DC, Garabrant DH, Pearce N, Bernstein L & Peters JM . Exposure to magnetic fields among electrical workers in relation to leukemia risk in Los Angeles County. American Journal of Industrial Medicine 26:47-60 (1994).

Matanoski GM, Breysse PN & Elliott EA. Electromagnetic field exposure and male breast cancer. Lancet 337:737 (1991).

Sahl JD, Kelsh MA, & Greenland S. Cohort and nested case-control studies of hematopoietic cancers and brain cancer among utility worker. Epidemiology 4:21-32 (1994).

Savitz DA & Loomis DP. Magnetic field exposure in relation to leukemia and brain cancer mortality among electric utility workers. American Journal of Epidemiology 141:123-134 (1995).

Sorahan T, Nichols L, van Tongeren M, & Harrington JM. Occupational exposure to magnetic fields relative to mortality from brain tumours: updated and revised findings from a study of United Kingdom electricity generation and transmission workers, 1973–97. Occupational and Environmental Medicine 58:626-630 (2001).

Thériault G, Goldberg M, Miller AB, Armstrong B, Guénel P, Deadman J, Imbernon E, To T, Chevalier A, Cyr D, & Wall C. Cancer risks associated with occupational exposure to magnetic fields among electric utility workers in Ontario and Quebec, Canada and France: 1970–1989. American Journal of Epidemiology 139:550-572 (1994).

Tynes T, Jynge H, & Vistnes AI. Leukemia and brain tumors in Norwegian railway workers, a nested case-control study. American Journal of Epidemiology 139:645-653 (1994).

Laboratory Animal EMF Studies

Anderson LE, Boorman GA, Morris JE, Sasser LB, Mann PC, Grumbein SL, Hailey JR, McNally A, Sills RC & Haseman JK. Effect of 13-week magnetic field exposures on DMBA-initiated mammary gland carcinomas in female Sprague-Dawley rats. Carcinogenesis 20:1615-1620 (1999).

Baum A, Mevissen M, Kamino K, Mohr U & Löscher W. A histopathological study on alterations in DMBA-induced mammary carcinogenesis in rats with 50 Hz, 100 mT magnetic field exposure. Carcinogenesis 16:119-125 (1995).

Babbitt JT, Kharazi AI, Taylor JMG, Rafferty CN, Kovatch R, Bonds CB, Mirell SG, Frumkin E, Dietrich F, Zhuang D & Hahn TJM. Leukemia/lymphoma in mice exposed to 60-Hz magnetic fields: Results of the chronic exposure study TR-110338. Los Angeles: Electric Power Research Institute (EPRI) (1998).

Babbitt JT, Kharazi AI, Taylor JMG, Rafferty CN, Kovatch R, Bonds CB, Mirell SG, Frumkin E, Dietrich F, Zhuang D & Hahn TJM. Leukemia/lymphoma in mice exposed to 60-Hz magnetic fields: Results of the chronic exposure study, Second Edition. Electric Power Research Institute (EPRI) and B. C. Hydro, Palo Alto, California and Burnaby, British Columbia, Canada (1999).

Boorman GA, Anderson LE, Morris JE, Sasser LB, Mann PC, Grumbein SL, Hailey JR, McNally A, Sills RC & Haseman JK. Effect of 26-week magnetic field exposures in a DMBA initiation-promotion mammary gland model in Sprague-Dawley rats. Carcinogenesis 20:899-904 (1999).

Boorman GA, McCormick DL, Findlay JC, Hailey JR, Gauger JR, Johnson TR, Kovatch RM, Sills RC & Haseman JK. Chronic toxicity/oncogenicity of 60 Hz (power frequency) magnetic fields in F344/N rats. Toxicological Pathology 27:267-278 (1999).

Boorman GA, McCormick DL, Ward JM, Haseman JK & Sills RC. Magnetic fields and mammary cancer in rodents: A critical review and evaluation of published literature. Radiation Research 153:617-626 (2000).

Boorman GA, Rafferty CN, Ward JM & Sills RC. Leukemia and lymphoma incidence in rodents exposed to low-frequency magnetic fields. Radiation Research 153:627-636 (2000).

Ekström T, Mild KH & Holmberg B. Mammary tumours in Sprague-Dawley rats after initiation with DMBA followed by exposure to 50 Hz electromagnetic fields in a promotional scheme. Cancer Letters 123:107-111 (1998).

Mandeville R, Franco E, Sidrac-Ghali S, Paris-Nadon L, Rocheleau N, Mercier G, Desy M & Gaboury L. Evaluation of the potential carcinogenicity of 60 Hz linear sinusoidal continuous-wave magnetic fields in Fisher F344 rats. Federation of the American Society of Experimental Biology Journal 11:1127-1136 (1997).

McCormick DL, Boorman GA, Findlay JC, Hailey JR, Johnson TR, Gauger JR, Pletcher JM, Sills RC & Haseman JK. Chronic toxicity/oncogenicity of 60 Hz (power frequency) magnetic fields in B6C3F1 mice. Toxicological Pathology 27:279-285 (1999).

Mevissen M, Lerchl A, Szamel M & Löscher W. Exposure of DMBA-treated female rats in a 50-Hz, 50 microTesla magnetic field: Effects on mammary tumor growth, melatonin levels and T-lymphocyte activation. Carcinogenesis 17:903-910 (1996).

Yasui M, Kikuchi T, Ogawa M, Otaka Y, Tsuchitani M & Iwata H. Carcinogenicity test of 50 Hz sinusoidal magnetic fields in rats. Bioelectromagnetics 18:531-540 (1997).

Laboratory Cellular EMF Studies

Balcer-Kubiczek EK, Harrison GH, Zhang XF, Shi ZM, Abraham JM, McCready WA, Ampey LL, III, Meltzer SJ, Jacobs MC, & Davis CC. Rodent cell transformation and immediate early gene expression following 60-Hz magnetic field exposure. Environmental Health Perspectives 104:1188-1198 (1996).

Boorman GA, Owen RD, Lotz WG & Galvin MJ, Jr. Evaluation of *in vitro* effects of 50 and 60 Hz magnetic fields in regional EMF exposure facilities. Radiation Research 153:648-657 (2000).

Lacy-Hulbert A, Metcalfe JC, & Hesketh R. Biological responses to electromagnetic fields. Federation of the American Society of Experimental Biology (FASEB) Journal 12:395-420 (1998).

Morehouse CA & Owen RD. Exposure of Daudi cells to low-frequency magnetic fields does not elevate MYC steady-state mRNA levels. Radiation Research 153:663-669 (2000).

Snawder JE, Edwards RM, Conover DL & Lotz WG. Effect of magnetic field exposure on anchorage-independent growth of a promoter-sensitive mouse epidermal cell line (JB6). Environmental Health Perspectives 107:195-198 (1999).

Wey HE, Conover DL, Mathias P, Toraason MA & Lotz WG. 50-Hz magnetic field and calcium transients in Jurkat cells: Results of a research and public information dissemination (RAPID) program study. Environmental Health Perspectives 108:135-140 (2000).

National Reviews of EMF Research

American Medical Association. Council on Scientific Affairs. Effects of Electric and Magnetic Fields. Chicago: American Medical Association (December 1994).

National Institute for Occupational Safety and Health, National Institute of Environmental Health Sciences, U.S. Department of Energy. Questions and Answers: EMF in the Workplace. Electric and Magnetic Fields Associated with the Use of Electric Power. Report No. DOE/GO-10095-218 (September 1996).

National Radiological Protection Board. ELF Electromagnetic Fields and the Risk of Cancer. Volume 12:1, Chilton, Didcot, Oxon, UK OX11 ORQ (2001).

National Research Council, Committee on the Possible Effects of Electromagnetic Fields on Biologic Systems. Possible Health Effects of Exposure to Residential Electric and Magnetic Fields. Washington: National Academy Press (1997).

National Institute of Environmental Health Sciences Report on Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields. NIH Publication No. 99-4493. Research Triangle Park, National Institute of Environmental Health Sciences (1999).

Portier CJ & Wolfe MS, Eds. Assessment of Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields—NIEHS Working Group Report NIH Publication No. 98-3981. Research Triangle Park, National Institute of Environmental Health Sciences (1998).

APPENDIX H-
Enertech Report

ADDENDUM REPORT

MAGNETIC FIELD MODELING ASSESSMENT FOR THE EXISTING DISTRIBUTION FACILITIES ALONG LITTLE TOR AND SOUTH MOUNTAIN ROADS

Prepared for
Orange & Rockland Utilities, Inc.
390 Route 59
Spring Valley, NY 10977

Prepared by
Enertech Consultants
494 Salmar Avenue Suite #200
Campbell, California 95008

January 29, 2014

NOTICE

This report was prepared by the organization(s) named below as an account of work sponsored by Orange & Rockland Utilities, Inc. Neither Orange & Rockland Utilities, Inc., Enertech Consultants, nor any person acting on behalf of either of them: (a) makes any warranty, express or implied, with respect to the use of any information, apparatus, method, or process disclosed in this report or that such use may not infringe privately owned rights; or (b) assumes any liabilities with respect to the use of or for damages resulting from the use of any information, apparatus, method, or process disclosed in this report.

Prepared by
Enertech Consultants of Santa Clara, Inc.
Campbell, California

EXECUTIVE SUMMARY

Orange & Rockland Utilities, Inc. is proposing to construct a new electric power substation, the "Little Tor Substation", which is located in New City, New York (near the intersection of South Mountain Road and North Little Tor Road). Orange & Rockland retained Enertech to perform a magnetic field assessment for the existing site and for the proposed substation configuration. A report, entitled "Magnetic Field Modeling Assessment for the Little Tor Substation", was issued May 26, 2009. Subsequent to this report, an addendum report was prepared to evaluate the magnetic fields associated with the existing 13.2 kV overhead distribution line configurations associated with the substation. Specifically, magnetic field calculations were performed for a single circuit 3-phase delta configuration and a double circuit 3-phase configuration which are present along Little Tor and South Mountain Roads. This addendum report contains the results of this evaluation.

Computer models were developed for a typical single circuit and double circuit configuration based upon engineering and design drawings supplied by Orange & Rockland of the existing distribution facilities present along Little Tor and South Mountain Roads. Proposed underground distribution lines are routed from the proposed Little Tor Substation and transition into the existing overhead configuration via riser poles within the property and along Little Tor Road. Nine loading scenarios were evaluated, ranging from 50 Amps to 450 Amps (in 50 Amp increments), to produce calculated magnetic field lateral profiles.

Table A presents the magnetic field calculation results for the single circuit delta configuration, with maximum values occurring near centerline and minimum values occurring at a distance of 100-feet from centerline. Calculation results are shown for each of the nine loading scenarios.

Table A. Calculated Magnetic Field Values for a Typical 3-Phase
Single Circuit Delta Distribution Line Configuration (Nine Loading Scenarios)

Current	Calculated Magnetic Field (mG)	
	Minimum Field	Maximum Field
50 Amps	0.2 mG	1.9 mG
100 Amps	0.4 mG	3.8 mG
150 Amps	0.6 mG	5.8 mG
200 Amps	0.8 mG	7.7 mG
250 Amps	0.9 mG	9.6 mG
300 Amps	1.1 mG	11.5 mG
350 Amps	1.3 mG	13.5 mG
400 Amps	1.5 mG	15.4 mG
450 Amps	1.7 mG	17.3 mG

Table B presents the magnetic field calculation results for the double circuit configuration, with maximum values occurring near centerline and minimum values occurring at a distance of 100-feet from centerline. Calculation results are shown for each of the nine loading scenarios.

Table B. Calculated Magnetic Field Values for a Typical 3-Phase Double Circuit Distribution Line Configuration (Nine Loading Scenarios)

Current	Calculated Magnetic Field (mG)	
	Minimum Field	Minimum Field
50 Amps	0.4 mG	3.7 mG
100 Amps	0.8 mG	7.3 mG
150 Amps	1.2 mG	10.9 mG
200 Amps	1.6 mG	14.6 mG
250 Amps	2.0 mG	18.2 mG
300 Amps	2.4 mG	21.9 mG
350 Amps	2.8 mG	25.5 mG
400 Amps	3.1 mG	29.2 mG
450 Amps	3.5 mG	32.8 mG

Calculated magnetic field levels for the single circuit delta distribution line configuration range from 0.2 mG to 17.3 mG, depending upon loading conditions and distance from centerline. Calculated magnetic field levels for the double circuit distribution line configuration range from 0.4 mG to 32.8 mG, depending upon loading conditions and distance from centerline. These calculated magnetic field levels, for both the single circuit and double circuit distribution line configurations, will decrease with distance from the Little Tor Substation as the downstream current is distributed to the homes and businesses serviced by the distribution lines.

1.0 INTRODUCTION

Orange & Rockland Utilities, Inc. is proposing to construct a new electric power substation, the "Little Tor Substation", which is located in New City, New York (near the intersection of South Mountain Road and North Little Tor Road). Orange & Rockland retained Enertech to perform a magnetic field assessment for the existing site and for the proposed substation configuration. A report, entitled "Magnetic Field Modeling Assessment for the Little Tor Substation", was issued May 26, 2009. Subsequent to this report, an addendum report was prepared to evaluate the magnetic fields associated with the existing 13.2 kV overhead distribution line configurations associated with the substation. Specifically, magnetic field calculations were performed for a single circuit 3-phase delta configuration and a double circuit 3-phase configuration which are present along Little Tor and South Mountain Roads. This addendum report contains the results of this evaluation.

Existing distribution line configurations along North Little Tor Road and South Mountain Road will not change with the addition of the Little Tor Substation. Since electrical power is presently being provided by other nearby substations, the proposed Little Tor Substation would only act as a new source for the same level of electrical power that presently exists. To interconnect the proposed Little Tor Substation into the existing overhead distribution system, four new 13.2 kV underground distribution circuits would be installed and routed out of the Little Tor Substation to connect to existing overhead distribution lines. These new interconnecting circuits are proposed to be located underground (rather than overhead) for aesthetic and exposure reasons. One 13.2 kV underground distribution line would connect to the existing overhead distribution line system (at South Mountain Road) via a riser pole within the substation property, a second underground line connects via a riser pole at the substation property line (at North Little Tor Road), and the remaining two underground lines are routed adjacent to North Little Tor Road to connect into the existing overhead distribution system at the southeast corner of the substation property (to avoid conflicts with an existing 34.5 kV overhead circuit). Although the load flow pattern of the overhead distribution system may change (due to the change in the source of the electrical power), no additional electrical load will be added to the overhead distribution system as a result of constructing the Little Tor Substation.

This study was performed to calculate magnetic fields from a typical single circuit 13.2 kV overhead delta distribution line (Figure 1) and double circuit 13.2 kV overhead distribution line (Figure 2) with current ranging from 50 Amps to 450 Amps (in 50 Amp increments). The Little Tor substation is located in a rural part of the town of New City and many of the homes are 70 or more feet from the distribution lines connecting to the Little Tor Substation. Therefore magnetic field calculations were performed out to a distance of 100-feet on either side of centerline from the distribution circuits.

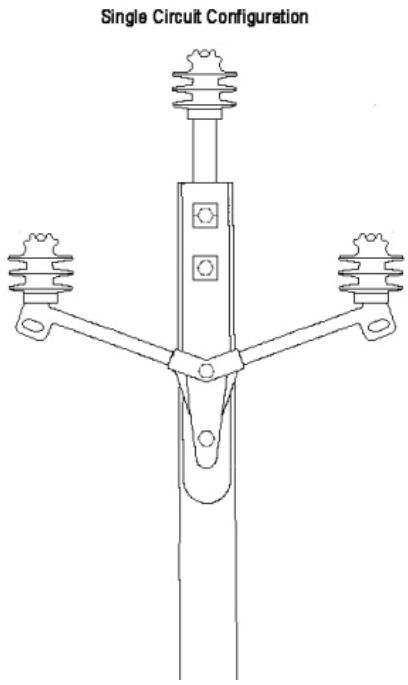


Figure 1. Single Circuit Delta Distribution Line Configuration

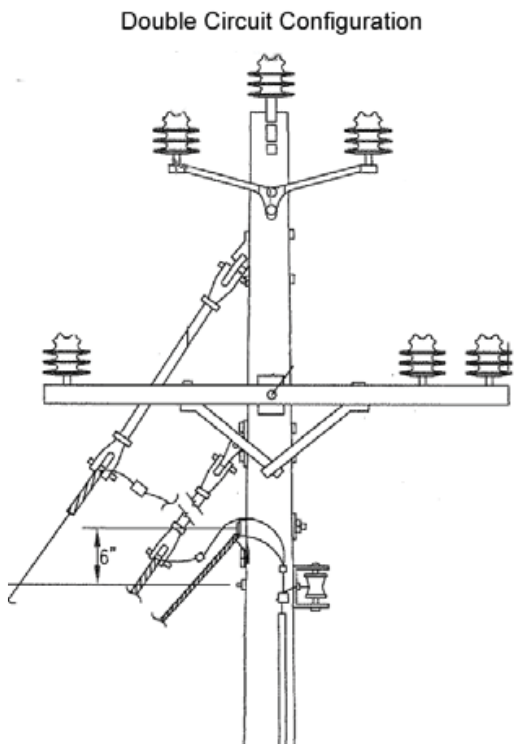


Figure 2. Double Circuit Distribution Line Configuration

2.0 DESCRIPTION OF THE COMPUTER MODELING SOFTWARE

Computer models were developed of the single circuit and double circuit distribution line configurations to calculate magnetic field levels associated with each configuration. The software program "EMF Workstation 2013", which is the latest EPRI magnetic field computer modeling program, was used to perform these magnetic field calculations. The EMF Workstation 2013 software can model the magnetic fields in and around transmission and distribution substations. The software produced calculation values along a predefined lateral profile route (+/- 100-feet from centerline of each circuit).

3.0 COMPUTER MODELING RESULTS

3.1 Single Circuit Delta Distribution Line Configuration

Calculated magnetic field levels for the single circuit delta distribution line configuration are presented in Figure 3 and Table 1. Nine different current values were used for the magnetic field calculations, ranging from 50 Amps to 450 Amps (in 50 Amp increments).

Calculated magnetic fields range from 0.2 mG (for the 50 Amp load at 100-feet from centerline) to 17.3 mG (for the 450 Amp load near centerline). Magnetic fields increase as loading increases, and decrease with distance away from the distribution line.

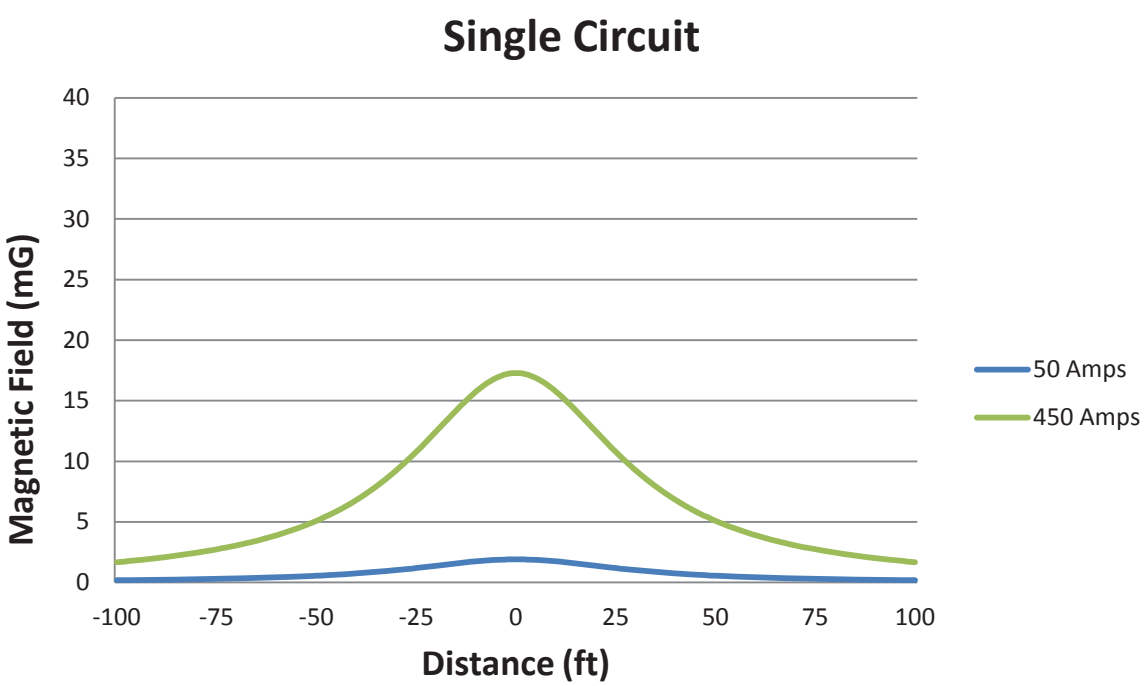


Figure 3. Calculated Magnetic Field for the Single Circuit Delta Configuration Profile (Loading from 50 Amps to 450 Amps)

Table 1. Calculated Magnetic Field Values for a Typical 3-Phase Single Circuit Delta Distribution Line Configuration (Nine Loading Scenarios)

Current	Calculated Magnetic Field (mG)	
	Minimum Field	Maximum Field
50 Amps	0.2 mG	1.9 mG
100 Amps	0.4 mG	3.8 mG
150 Amps	0.6 mG	5.8 mG
200 Amps	0.8 mG	7.7 mG
250 Amps	0.9 mG	9.6 mG
300 Amps	1.1 mG	11.5 mG
350 Amps	1.3 mG	13.5 mG
400 Amps	1.5 mG	15.4 mG
450 Amps	1.7 mG	17.3 mG

3.2 Double Circuit Distribution Line Configuration

Calculated magnetic field levels for the double circuit delta distribution line configuration are presented in Figure 4 and Table 2. Nine different current values were again used for the magnetic field calculations, ranging from 50 Amps to 450 Amps (in 50 Amp increments).

Calculated magnetic fields range from 0.4 mG (for the 50 Amp load at 100-feet from centerline) to 32.8 mG (for the 450 Amp load near centerline). Magnetic fields again increase as loading increases, and decrease with distance away from the distribution line.

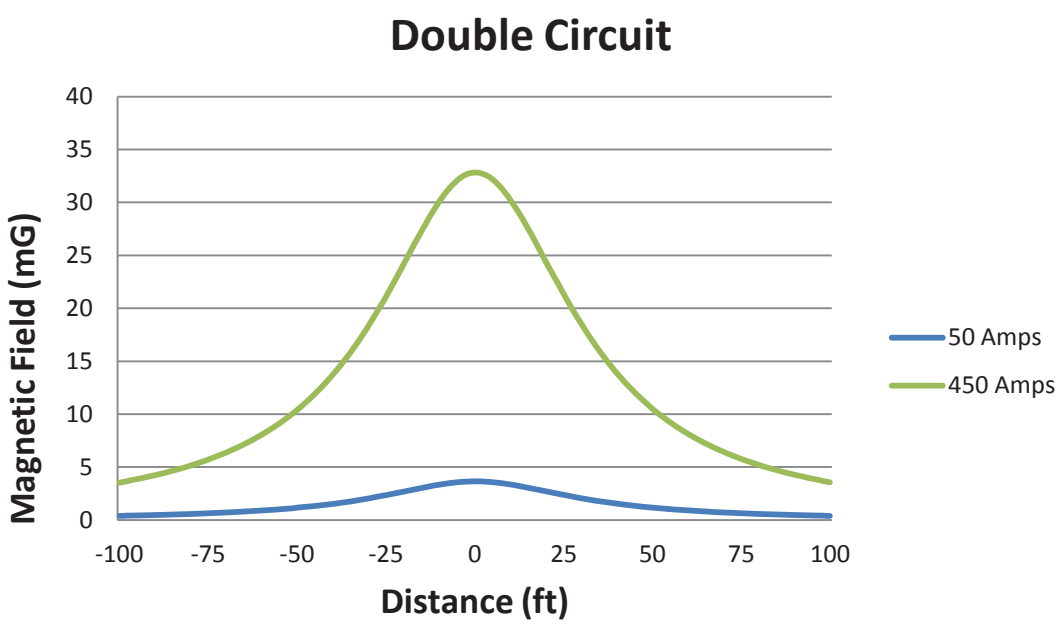


Figure 4. Calculated Magnetic Field for the Double Circuit Delta Configuration Profile (Loading from 50 Amps to 450 Amps)

Table 2. Calculated Magnetic Field Values for a Typical 3-Phase Double Circuit Distribution Line Configuration (Nine Loading Scenarios)

Current	Calculated Magnetic Field (mG)	
	Minimum Field	Minimum Field
50 Amps	0.4 mG	3.7 mG
100 Amps	0.8 mG	7.3 mG
150 Amps	1.2 mG	10.9 mG
200 Amps	1.6 mG	14.6 mG
250 Amps	2.0 mG	18.2 mG
300 Amps	2.4 mG	21.9 mG
350 Amps	2.8 mG	25.5 mG
400 Amps	3.1 mG	29.2 mG
450 Amps	3.5 mG	32.8 mG

These calculated magnetic field levels, for both the single circuit and double circuit distribution line configurations, will decrease with distance from the Little Tor Substation as the downstream current is distributed to the homes and businesses serviced by the distribution lines.

APPENDIX I-
Written Correspondence

Debbie Tretola

From: Anthony Montalbano
Sent: Wednesday, June 06, 2012 11:12 AM
To: 'Coffey, John'; Lanza, Joanne; Homenick, Michael V; Utschig, Jr., Charles W
Subject: O&R Little Tor
Attachments: Fwd: Follow-Up Re: South Mountain Road Substation (Simoes email w/ PICTURES-ATTACHED)

I spoke with Bob Geneslaw this morning concerning the Supplemental EIS. I'm not sure what the Planning Board's position will be at the conclusion of the hearing this evening. I also spoke with Bob about our presentation and he was not sure how Shirley was going to proceed. He suggested I speak with Shirley and Joe Simoes. I spoke with Joe Simoes who told me he would speak with Shirley when she comes in.

We should be prepared to respond to the two questions that were left open at the hearing and the specific chairperson asked us to respond to as follows:

1. EMFs
2. Fires/explosions

With respect to fires and explosions, as you may recall, Shirley asked the we distinguish and explain the episodes that happened with ConEd which were mentioned by Marvin at the hearing.

Geneslaw told me that the Chairperson had received an email from Marvin Baum with pictures. Simoes forwarded the attached to me this morning. You may want to look at the links and again, as you did yesterday, be in a position to distinguish those incidents from the Little Tor substation.

I am not sure when they will want you to respond to Geneslaw's memo. Simoes thought that it should be responded to after you discuss #1 and 2 above. Geneslaw indicated you may be asked to respond after public comments. In any event, we should follow your outline of responses to Geneslaw's memo.

As soon as I have something further, I'll let you know.

Regards,
Tony

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Tel: 845-634-7010, extension 201
Fax: 845-634-8993
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Website: www.mcfnylaw.com

Debbie Tretola

From: Jose Simoes [j.simoes@clarkstown.org]
Sent: Wednesday, June 06, 2012 10:24 AM
To: Anthony Montalbano
Subject: Fwd: Follow-Up Re: South Mountain Road Substation
Attachments: ScreenHunter_10 Dec. 19 21.53.jpg; ScreenHunter_04 Dec. 19 21.36.jpg; ScreenHunter_06 Dec. 19 21.40.jpg; ScreenHunter_08 Dec. 19 21.52.jpg; Con Ed substation in DUMBO catches fire after residents hear explosion - NY.pdf; Con Ed_ Cause of Saturday's Explosion Undetermined - Pleasantville-Briarclif.pdf; Con%20Ed%20Transformer%20Fire%20and%20Oil%20Spill(1).pdf; From Tremont Tribune.doc; JN Article on Bronx River Oil Spill 11-17-09.doc; December 8 2009 JN Article of Yonkers Fire.doc; Fire damages Con Ed transformer in Dunwoodie.doc; Substation Fire In Yonkers -- MYFOXNY 11-04-09.doc

---------- Forwarded message ----------
From: **Marvin Baum** <marvin@baum.tv>
Date: Fri, May 25, 2012 at 1:27 PM
Subject: Follow-Up Re: South Mountain Road Substation
To: Shirley Thormann <s.thormann@clarkstown.org>
Cc: Rosalie Cautillo <r.cautillo@clarkstown.org>, Jose Simoes <j.simoes@clarkstown.org>, Bob Geneslaw <rgeneslaw@aol.com>, Shirley Lasker <shirlasker@aol.com>, Terri Thal <thal.terri@gmail.com>, Martus Granirer <martus@granirer.us>, "Walker, Kirsten" <kwalker@enduranceservices.com>

Dear Ms. Thormann:

I am attaching copies of the articles about the Con Edison, Inc., substations in NYC and Westchester that I quoted at the recent Clarkstown Planning Board meeting on the proposed South Mountain Road substation by the Applicant, a division of Con Edison. Both of these substations had the explosions and fires on the very weekend before the Public Hearing. As I stressed at the meeting, the euphemistic language, descriptions of risks and emergency planning in the O&R DEIS were totally inadequate.

In my presentation, I also referred to several other explosions and fires experienced by Con Edison, Inc., including a massive explosion and fire in November 2009 at the Dunwoodie Substation in Yonkers, which was followed by an oil spill in the Bronx River two miles away as a result of this fire. Several months later in June 2010, that substation experienced another explosion/fire. I am attaching articles and photos about the first Dunwoodie "event" and subsequent oil spill.

Other major explosions and fires at substations have taken place in recent weeks and months at other utility company substations across the country including in Edison (http://www.nj.com/news/index.ssf/2012/02/edison_transformer_fire_shoots.html), Boston (http://www.reuters.com/article/2012/03/14/us-boston-fire-idUSBRE82D0DS20120314), Portland (http://www.wmtw.com/Substation-Fire-Causes-Portland-Power-Outage/-/8792672/9569452/-/11x0ue0z/-/index.html) and New Orleans (http://www.fox8live.com/story/18406268/fire-at-power-substat). The most

recent substation fire took place just hours ago in Ashville and was caused by a black snake: (http://www.citizen-times.com/article/20120525/NEWS/305240057/Black-snake-blamed-electrical-substation-fire-near-Asheville?odyssey=tab%7Ctopnews%7Ctext%7CFrontpage)

Here are the two videos that I showed at the meeting of substation explosions and fires:

http://youtu.be/WkDCS8xeobg

http://youtu.be/pdDolznk9eY

With the dangers demonstrated by these videos, the links to recent substation "events," and the attached articles, I have a particular concern about the proposed location, which will also be the site of a gas line regulator. Take a look at what happened some years ago in Edison, NJ: http://www.youtube.com/watch?v=NyMbaZ9FVjA

More recently, a massive deadly gas line explosion took place in California: http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2010/09/09/BADP1FBJRS.DTL

The O&R DEIS does not at all address the potential risks associated with the co-location of the substation and gas regulator facilities. Do these two facilities together pose an increased risk to the safety of residents in Clarkstown that either would if located separately? I would like to request that this question be addressed by the Planning Board.

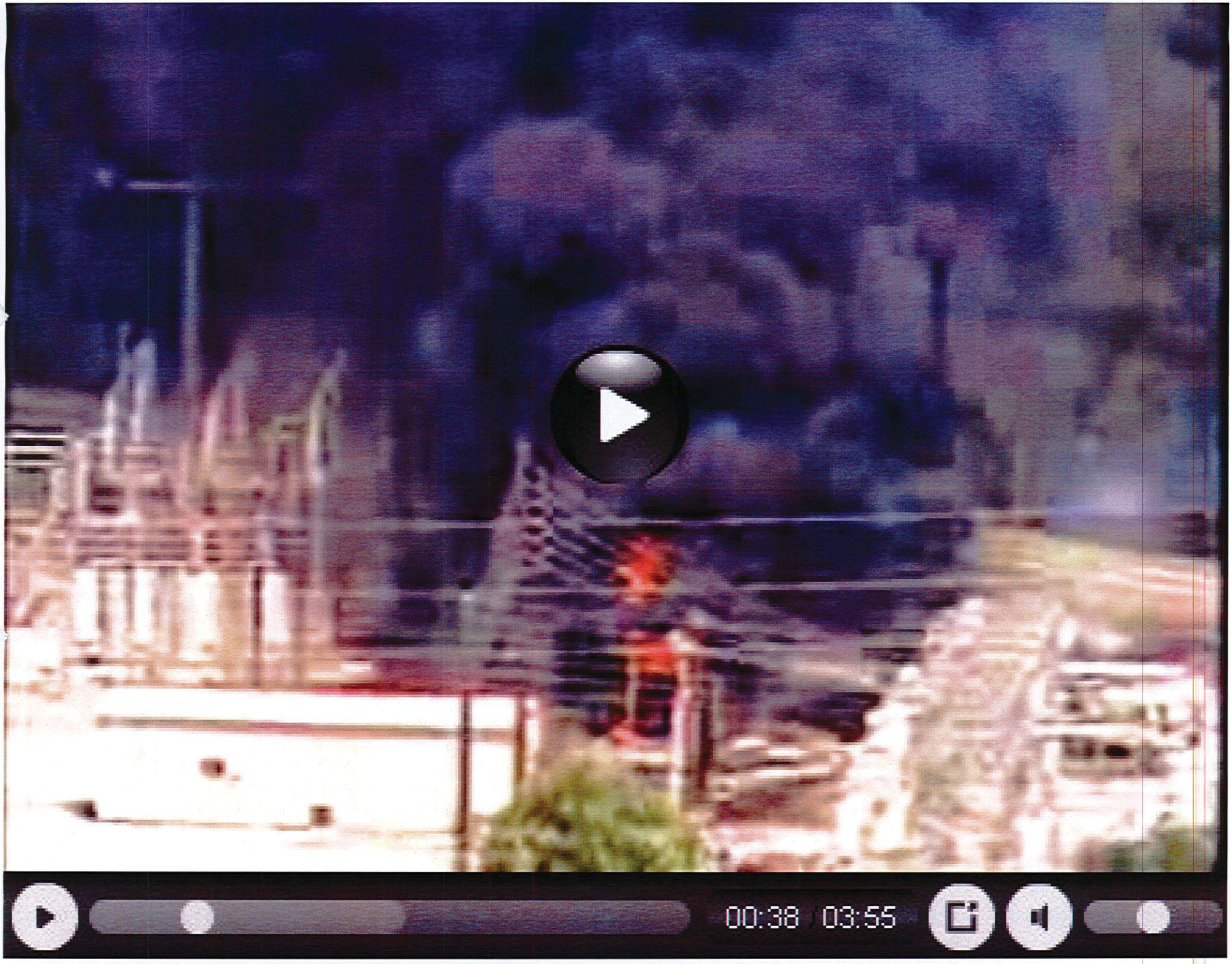
Also, I'd like to request that this email be forwarded to all members of the Clarkstown Planning Board so that they can review these materials.

Thank you very much.

Sincerely,

Marvin Baum

Con Ed probes Yonkers substation blaze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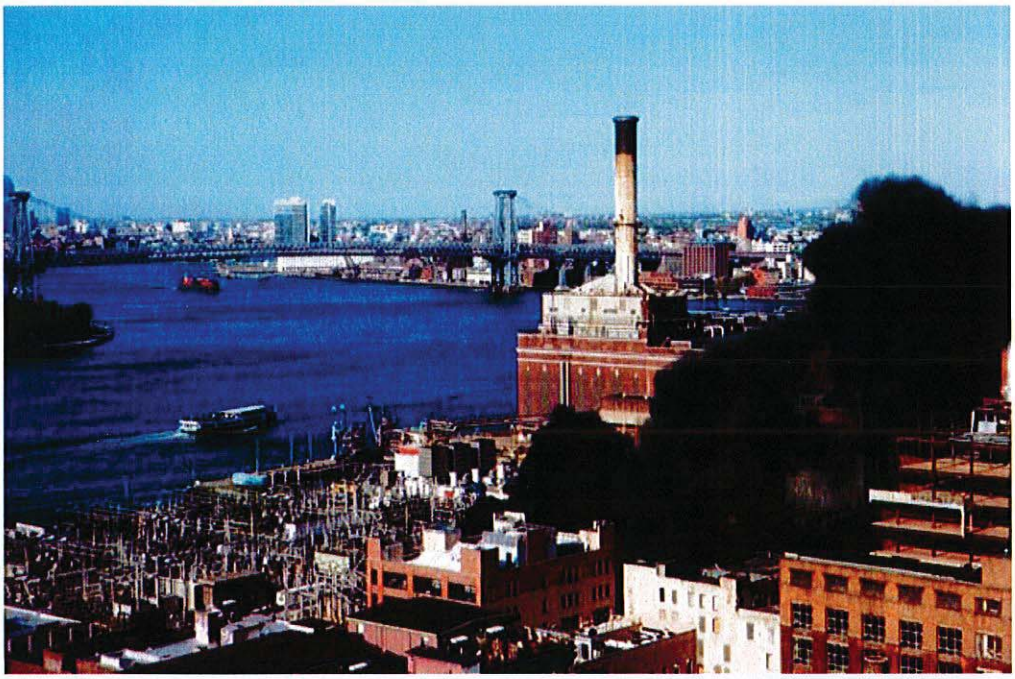
NYDailyNews.com
DAILY NEWS | New York

Con Ed substation in DUMBO catches fire after residents hear explosion

Thick smoke cloud visible from Manhattan

BY OLE SKAAR AND SARAH ARMAGHAN / NEW YORK DAILY NEWS

Published: Sunday, April 29, 2012, 8:04 PM
Updated: Sunday, April 29, 2012, 8:04 PM



BETH KEISER/GETTY IMAGES

A fire Sunday afternoon at a Con Ed facility near the base of the Manhattan Bridge in Brooklyn.

Firefighters grappled with an outdoor blaze at a Con Edison substation in a trendy Brooklyn neighborhood Sunday, officials said.

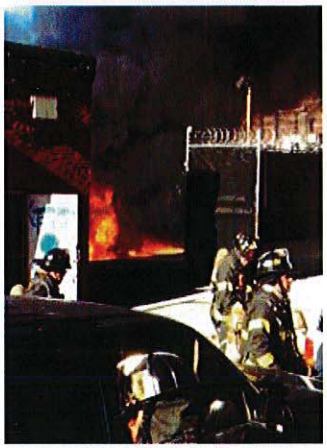
An outdoor reactor - which transfers voltage - caught fire at the plant on John and Bridge Streets in DUMBO around 5:15 p.m., a Con Ed spokesman said.

Passersby who called 911 reported hearing an explosion, but officials could not immediately determine if a blast occurred.

"I was taking a nap and it was definitely loud enough to wake me up," said Tom Masotto

, 50, who lives on the street.

Thick black smoke that could be seen from lower Manhattan billowed through the sky, while the FDNY used foam to subdue the flames that were put out around 6:40 p.m.



KATIE NELSON/NEW YORK DAILY NEWS

Firefighters arriving at a Con Ed facility near the base of the Manhattan Bridge in Brooklyn.

Area residents said this is the second time in six months a fire had erupted at the Con Edison site.

No injuries were reported, and there were no customer outages, authorities said.

Editor Sarah Studley sarah.studley@patch.com

Police & Fire

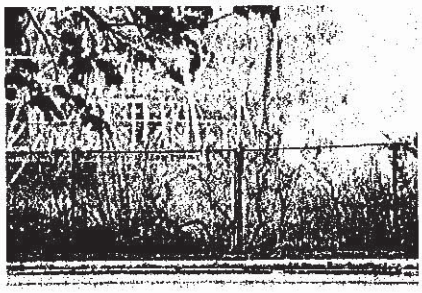
Con Ed: Cause of Saturday's Explosion Undetermined

The explosion and subsequent fire are still under investigation.

By Sarah Studley Email the author April 30, 2012

Recommend Tweet 0 Email Print Comment

Related Topics: Con Edison and Pleasantville Fire Department



The explosion and fire at Pleasantville's Con Edison substation that closed part of Manville Road for several hours on Saturday is still under investigation, according to Chris Olert, a Con Edison spokesman.

"We don't have a cause [yet]," Olert told Patch Monday afternoon.

While the brush fire that started after an explosion was heard around the neighborhood (according to Patch readers on Facebook), was put out within an hour by Pleasantville Fire Department responders, but the road remained closed from about 5:45 to 10 p.m.

Olert confirmed no residents lost power as a result of the incident "because we have a redundant system."

He said Con Edison will have more information about the repairs and cause of the incident in the coming days.

"We obviously will be pushing to get it back up because the busiest season for us for electricity is coming up," he added. "That's the summertime."

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Con Edison Substation Fire Causes Oil Spill on the Bronx River

Oil in a 345,000-volt transformer caught fire just before 5:30 a.m. yesterday, November 4, 2009, at the Dunwoodie substation at 152 Kingston Ave., just west of the state Thruway and 1.5 miles from the Bronx River. Oil from the transformer reached the Bronx River, possibly via storm drains. As of today at 5:30 pm, Con Edison is continuing to work on the cleanup with the NY State Department of Environmental Conservation (DEC) Emergency Response Team and the NY City Department of Environmental Protection (DEP).

Here is a report on the measures we've been taking to monitor and communicate about the spill.

Con Edison notified Linda Cox, Executive Director of the Bronx River Alliance and the Bronx River Adminstrator for the New York City Department of Parks & Recreation, yesterday afternoon around 2 pm. Linda immediately notified NYC Parks, and both the BxRA Conservation Crew and Parks Natural Resource Group staff investigated. Booms placed by Con Edison and DEC to contain and absorb the spill were already in place at several locations along the river. Staff members observed oil slicks and strong petroleum smells along the river, and oil seeping under the booms, heading downriver. The Alliance has been keeping in close contact with Con Edison, Parks and neighboring partners such as the New York Botanical Garden and the Bronx Zoo – all who observed the spill on their sites.

Today the Alliance and NRG investigated sites as far south of Hunts Point Riverside Park and took photographs and water samples. Oil is still being observed and is trapped among rocks at various points along the river, particularly in the Bronx River Forest. Con Edison crews will walk the site to physically assess the situation and take any further action.

The fluid is a dielectric, insulating mineral oil and contains Polychlorinated biphenyls, or PCBs, in "miniscule" amounts – 4 parts per million. (Fluid is considered a PCB contaminant if it contains 50 – 500 parts per million, and is considered PCB if it has more than 500 parts per million.) We recommend that no one enter or disturb the water and that you contact us if you see injured wildlife or other issues at 718.430.4665. We will continue to make updates on this webpage as we know more.

From Tremont Tribune

ConEd Reacts Quickly to Bronx River Oil Spill, But Concerns Linger

December 7, 2009

THE CLEAN-UP OPERATION IN THE BRONX BOTANICAL GARDEN, HOME TO 1.2 MILES OF THE BRONX RIVER (Photos: P. Egan)

By PATRICK EGAN

In the days before Thanksgiving, dozens of workers in hard hats and orange and yellow vests trudged along the banks of the Bronx River sopping and scooping up the last remnants of a Nov. 4 oil spill from a Consolidated Edison substation in Yonkers.

Conservation experts heralded Con Edison's quick and diligent response but wouldn't go so far as to give the river's ecosystem a clean bill of health.

"We're watching very closely for harm to wildlife," said Linda Cox, who heads the Bronx River Alliance, a non-profit that works to restore and protect the river. "Our concern is more about whether there would be more subtle, longer-term effects."

The spill occured when an explosion at the Dunwoody substation sparked a blaze fueled by dielectric oil, a fluid similar to mineral spirits. "We're still trying to figure out the cause," said Chris Olert, a Con Edison spokesperson.

As emergency crews sought to contain the fire, Olert said, fewer than 100 gallons of oil escaped into the Bronx River, home to bullfrogs, painted turtles, carp and much more.

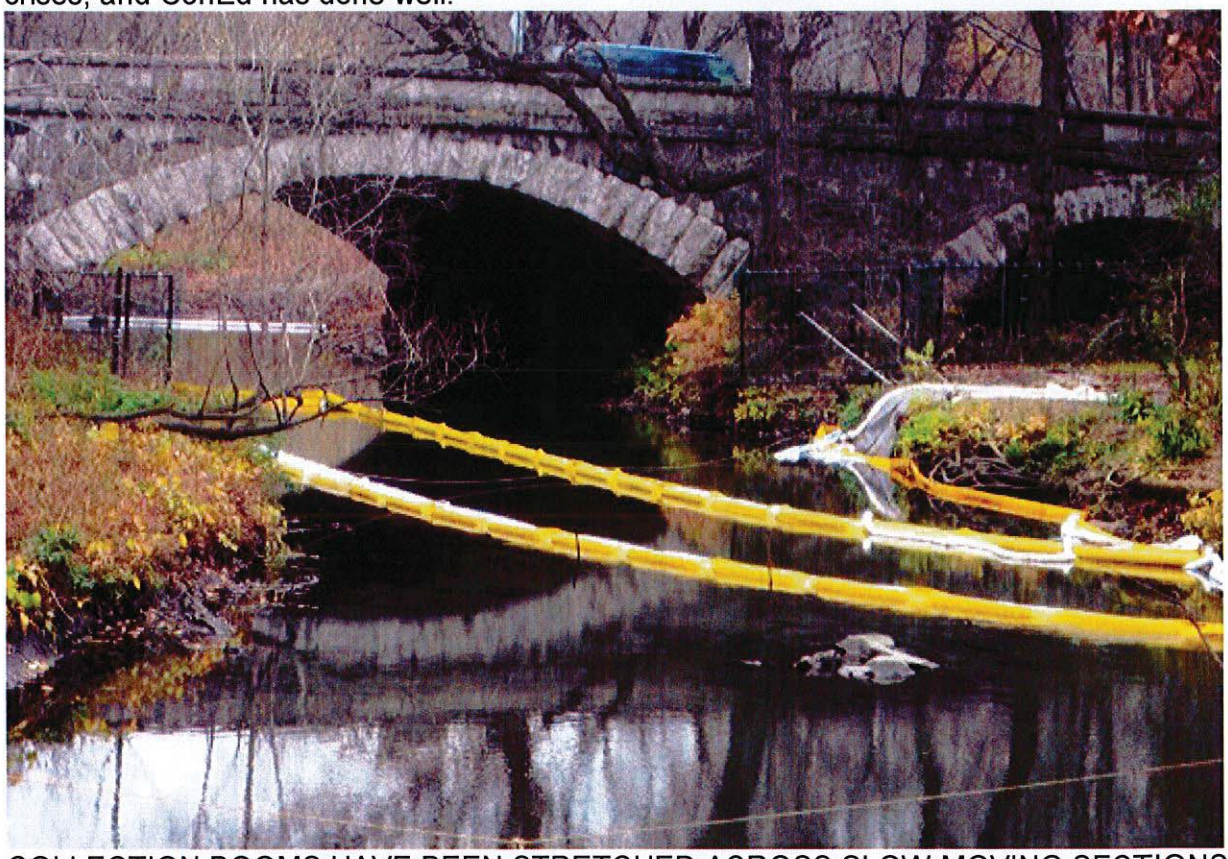
The New York State Department of Environmental Conservation (DEC) questioned the amount of oil actually spilled. "No one can truly know how much oil entered the river in Yonkers, and any such estimates are somewhat speculative in nature," said Thomas Panzone, a spokesperson, in an e-mail.

Conservationists agree that Con Edison's reaction is an improvement on the ultility company's response the last time it spilled oil into the river seven years ago. Bob Heinisch, who directs site

operations at the New York Botanical Garden, home to about 1.2 miles of the 24-mile Bronx River, remembered far less urgency on ConEd's part in 2002. Some ducks and other wildlife had been soaked in oil.

"It's like night and day," said Heinisch. "Some days they have 60 guys in here."

The Bronx Zoo echoed that opinion. "We haven't had any impact on our part of the river," said John Calvelli, who's in charge of public affairs. "You look at how organizations respond to these crises, and ConEd has done well."



COLLECTION BOOMS HAVE BEEN STRETCHED ACROSS SLOW-MOVING SECTIONS OF THE RIVER TO NET OILY DEBRIS

Throughout most of November, an outfit hired by Con Edison floated a tangle of absorption and collection booms on slow-moving sections of the river, many of which are on the grounds of the Botanical Garden. Absorption booms are tubes of soaking materials that draw oil from the water; workers called them "sausages." Collection booms net oily debris like leaves and grass. A giant machine—like a shop-vac on wheels—near the riverbank sucked all the muck out of the water.

The cleaning crews wrapped up work before Thanksgiving, but will return this month with the DEC to look for residual oil, according to Con Edison.

"We will physically walk every foot of the river with the DEC," said Neil Scow, who handles environmental issues for Con Edison. "We have the same level of concern for the environment as they do."

So far, public awareness of the spill has been minimal, but other stakeholders with an interest in the river's health are keeping a close watch.

"I was deeply concerned to hear about the recent oil spill into the Bronx River," said Congressman José E. Serrano via e-mail. "If this spill isn't thoroughly cleared, we could see some of the environmental progress we have made wiped out."

While the Bronx River Alliance is satisfied with Con Edison's rapid response, it remains concerned about the utility company's safety procedures.

"There are measures built around a transformer to catch oil in such an incident, and I don't think that system worked," said the Bronx River Alliance's Linda Cox.
No one wants a return to the conditions found in the mid-1970s, the height of the Bronx River's decay, when the waterway was polluted and littered with trash.
"We're proud of the fact that we have a lot of eyes on the river," Cox said.
Written by admin · Filed Under Health & Environment, Latest, News/Features

LoHud.com
New Yorkers Lower Hudson Valley

November 17, 2009

Con Ed fire spurs oil cleanup along Bronx River

Ernie Garcia
elgarcia@lohud.com

YONKERS — An explosion at a Consolidated Edison substation has set off a massive oil-spill cleanup along the Bronx River.

Scores of workers are cleaning up an unknown quantity of a light, clear oil similar to mineral oil that flowed into the city's storm sewer system on Nov. 4 when a 345-kilovolt transformer containing 30,000 gallons of the fluid caught fire. A machine malfunction created an electrical arc that ignited the oil at 152 Kingston Ave. in the Dunwoodie neighborhood.

The resulting smoky fire was controlled in 20 minutes, and no one lost power from the event. Much of the oil, which was used as a dielectric fluid to cool the transformers, burned or remained on-site, but some of it mixed with the water used to quell the flames and escaped into the city's sewer system, where it flowed into the Bronx River near the Cross County Parkway.

A Con Edison spokesman said that cleanup of the escaped oil began the day of the fire. According to the state Department of Environmental Conservation, the fluid initially eluded capture by booms, a type of sponge that absorbs oil, because of fast-moving water along the river.

Crews hired by Con Edison are now working in areas where the river's flow is slower, mainly near the Bronx Zoo and the New York Botanical Garden.

On Sunday, dozens of workers could be seen at the zoo and garden, placing booms and doing other remediation work. The sewer pipe that delivered the oil to the river is also being cleaned.

Much of the oil has mixed with fallen leaves, and crews are using large vacuum trucks to extract the oil and leaves from the riverbanks.

"Right now what's been found are trace amounts of oil in the form of rainbow sheens," Con Edison spokesman Bob McGee said Monday.

The DEC has not discovered any wildlife injured by the oil spill, but the agency's biologists are checking the contaminated area.

Lori Severino, a spokeswoman for the DEC, declined to say on how long the clean-up might last. McGee said the utility will continue its clean-up until the DEC decides that the problem has been addressed.

McGee said that the utility did not yet have a cost estimate for the work. According to the DEC, there are 73 people involved in the cleanup, including 10 Con Edison employees and 63 workers from an outside contractor.

LoHud.com
New York's Lower Hudson Valley

December 8, 2009

Explosion highlights the dangers of substation expansion

Annette Vizzini

At 5 a.m. on Nov. 4, the residents of Gramatan Drive were jolted out of their sleep by the sound of a series of explosions.

About 150 feet from the fence separating our homes from the Dunwoodie Substation in Yonkers, a transformer exploded, with the resulting fire reaching 300 feet into the air.

The smoke was black and dense. Police officers banged on our doors to evacuate us. Children were traumatized and elderly residents were confused and afraid. The heat from the fire was so intense that the residents could feel it from the street.

For a year, we have been complaining to Con Edison about the noise emitting from the transformer involved in the explosion. All Con Edison did was test the decibel level and concluded that the noise was within the "acceptable level."

The noise became louder and we continued to complain to no avail until our complaints were heard by all — on the morning of the fire.

Did anyone test the machinery to determine if the increased noise was the result of an impending machine malfunction?

For many years, Gramatan Hills Homeowners Association has fought against the expansion of the Dunwoodie Substation because it is surrounded, on three sides, with residences. Our arguments fell on deaf ears. As president of GHHA, I wrote to every government agency involved, on all levels, most of whom did not even respond to my letter.

The residents of Gramatan Drive are greatly impacted by the substation. Not only do we have towers with the high-tension wires within feet of our homes but hundreds of trees were cut down for the expansion of the substation, which exposed us to the noise of the Thruway, deprived us of the many benefits trees afford, eliminated the wildlife in the area and diminished our property values.

The expansion has placed two series reactors immediately behind our homes with 52,000 gallons of dielectric oil (the oil that burned in the explosion) running through their pipes.

When the series reactors were proposed, the Yonkers Planning Board members believed Con Edison's statement that the reactors could only be placed behind our homes. GHHA fought this location. Again, our arguments fell on deaf ears.

With the fire, the fears of the residents of Gramatan Drive were realized.

We live with this fear every day as we know that an explosion involving 52,000 gallons of dielectric oil could mean the loss of lives and homes.

GHHA is now calling upon our city, county and state administrations to step up to the plate and recommend that the series reactors be removed from their present site.

Con Edison hides behind the "public need" argument whenever it forces a controversial project on the residents of this city. Relocating the reactors does not interfere with Con Edison's goals but will have an impact on saving property and lives should another explosion occur.

Who will take the responsibility if an accident or tragedy occurs with the series reactors? Con Edison? Our elected officials? The time to act is now. We have been forewarned by this explosion.

Fire damages Con Ed transformer in Dunwoodie, NY

NEW YORK, Nov 4 (Reuters) - A fire consumed a power transformer at Consolidated Edison Inc's (ED.N) Dunwoodie substation in Yonkers, New York early Wednesday morning, a company spokesman said.

He said the fire affected only one of the station's many transformers and did not cause any injuries or cut off service to any customers.

With many redundant systems at the substation, the spokesman said the company was able to continue to moving power through the station despite the fire.

Electricity traders noted Dunwoodie was a major substation that transports power from Upstate New York and the Indian Point nuclear power plant to New York City and Westchester.

The fire started at about 5 a.m. Eastern time and was still burning.

The spokesman said Con Edison did not know the cause of the fire but would conduct an investigation once the fire was extinguished.

Con Edison, of New York, provides electric, gas and steam service to more than 3 million customers in New York City and Westchester County, New York. (Reporting by Scott DiSavino; Editing by John Picinich)

Substation Fire In Yonkers

Police: Residents Should Keep Windows Shut

Updated: Wednesday, 04 Nov 2009, 5:59 PM EST
Published : Wednesday, 04 Nov 2009, 6:26 AM EST

- KATHY CARVAJAL
  MYFOXNY.COM

MYFOXNY.COM - Yonkers officials advise residents to keep their windows, doors and ventilation systems shut after a massive fire at the Con Edison substation at 142 Kingston Avenue.

The flames broke out at around 5 a.m. on Wednesday. Firefighters brought the fire under control several hours later. Witnesses reported hearing several explosions at the site. There were no power outages.

SkyFoxHD was over the scene at around 6 a.m. as firefighters appeared to be getting the upper hand on the flames.

Yonkers Fire Department officials say homes on three streets in the area were evacuated as a precaution. SkyFoxHD Reporter Kai Simonsen said homes in the area did not appear to be in danger.

Massive plumes of smoke could be seen for miles. The New York State Thruway runs near the substation. Smoke covered a portion of the roadway during the morning rush.

An **electrical substation** is used by power companies to transform voltage.

Debbie Tretola

From: Jose Simoes [j.simoes@clarkstown.org]
Sent: Friday, June 15, 2012 9:08 AM
To: Anthony Montalbano
Subject: Fwd: O&R DEIS Issue
Attachments: image003.jpg

---------- Forwarded message ----------
From: **Marvin Baum** <marvin@baumimagegroup.com>
Date: Thu, Jun 14, 2012 at 5:19 PM
Subject: O&R DEIS Issue
To: s.thormann@clarkstown.org
Cc: Jose Simoes <j.simoes@clarkstown.org>, Shirley Lasker <shirlasker@aol.com>, a.mele@clarkstown.org, Bob Geneslaw <rgeneslaw@aol.com>, Martus Granirer <martus@granirer.us>, Terri Thal <thal.terri@gmail.com>, Mark Gilliland <mg@markg.org>, Patricia Podolak <patricia.podolak@verizon.net>, artgirl22@earthlink.net, annejaffeholmes@me.com, christopher.crane@yahoo.com, Susan Porcino <sporcino@hotmail.com>, Walter Rodriguez <wrodriguez@tasrc.com>, "Walker, Kirsten" <kwalker@enduranceservices.com>, JHOL49@aol.com, Anthony Montalbano <am@mcfnylaw.com>

Dear Ms. Thormann:

O&R just received a multi-year rate increase from the PSC to pay for, among other things, the upgrade of their transmission and distribution systems:

http://nanuet.patch.com/articles/state-oks-o-r-rate-hike?ncid=newsltuspatc00000003

Without even reading the details of the Rate Case submitted to the PSC by O&R, I'd be fairly certain that taxes on transmission and distribution systems would be covered by this and/or future rate increases.

In several areas of the DEIS, O&R indicates that, if approved, the proposed substation will "benefit" Town of Clarkstown and the local school district from increased property taxes generated, but they don't identify exactly who will be funding these taxes.

If my understanding is correct, the people funding the taxes will be O&R's ratepayers... the same people who pay local taxes. The payment of these taxes will drive up the overall cost of living in Clarkstown, offsetting the benefit that is being touted in the DEIS.

Therefore, the DEIS should, at each discussion of the tax revenue generated, identify the source of funding for these increased taxes (i.e. through rate increases imposed upon ratepayers by the PSC).

Please include this email and my request as part of the official record.

Thank you.

Sincerely,

Marvin Baum

~!~

Government, Business

State OKs O&R Rate Hike

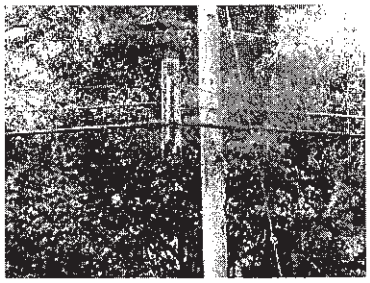
Three-year plan hits electric bills on July 1; average monthly bill goes up $3.06.

June 14, 2012

Recommend 2 Tweet 0

Email Print 5 Comments

Related Topics: Electricity, Orange and Rockland Utilities, Rate Hikes, and electric rates



A new electric rate plan for Orange and Rockland Utilities was approved today by the state Public Service Commission.

The three-year plan will affect O&R electric customers' bills beginning July 1. O&R filed the request on July 29, 2011, kicking off a public review process with the state Department of Public Service and interested parties, including consumer advocacy groups and local governments.

As a result of the approval today, effective July 1, the total electric bill for a typical residential electric full service customer using a monthly average of 677 kilowatt hours (kWh) would increase overall on average of $3.06 per month, from $116.80 to $119.86.

O&R says the rate plan provides for tens of millions of dollars in investment in the communities O&R serves in Rockland, Orange and Sullivan counties in New York for energy efficiency and for building new substations and upgrading infrastructure, including transmission and distribution lines and facilities, to provide reliable service.

In addition to enabling investments to help provide O&R's 221,000 New York electric customers with power, at the same time, the utility says the plan will allow O&R to continue to attract the required capital to finance these projects at a reasonable cost.

The new electric rate plan reflects a levelized increase in revenues of $15.223 million per year for three years.

The increases in electric revenues are 1.7 percent, 2.7 percent, and 2.7 percent on a total bill basis and 3.9 percent, 5.8 percent and 5.4 percent on a delivery basis for the three years starting July 1, 2012, July1, 2013 and July 1, 2014.

This rate filing only covers the cost of delivering electricity to O&R's customers. The other two components that affect the monthly electric bill are the cost of the electricity itself --- the largest portion of the bill --- which is set by largely unregulated market activity, and taxes and fees. O&R's energy efficiency programs are aimed at lowering the customer usage of electricity. When that usage declines, so do the charges for the commodity, taxes and fees.

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Town of Clarkstown

Diane Papenmeyer <d.papenmeyer@clarkstown.org>

Fwd: Additional Comments for DEIS -- Healty & Safety + Accessory Uses of Substations

1 message

Jose Simoes <j.simoes@clarkstown.org> Thu, Jun 21, 2012 at 10:57 PM
To: Diane Papenmeyer <d.papenmeyer@clarkstown.org>

Hi Diane,

Print this out for Shirley and the file and don't forget the attachments.... Are you making copies of all of these e-mails for the Planning Board packets too?
Thanks,
Joe

---------- Forwarded message ----------
From: **Marvin Baum** <marvin@baumimagegroup.com>
Date: Thu, Jun 21, 2012 at 2:49 PM
Subject: Additional Comments for DEIS -- Healty & Safety + Accessory Uses of Substations
To: s.thormann@clarkstown.org
Cc: Jose Simoes <j.simoes@clarkstown.org>, Bob Geneslaw <rgeneslaw@aol.com>, Shirley Lasker <shirlasker@aol.com>, Martus Granirer <martus@granirer.us>, Terri Thal <thal.terri@gmail.com>, "Walker, Kirsten" <kwalker@enduranceservices.com>, Amy Mele <a_mele@town.clarkstown.ny.us>, Anthony Montalbano <am@mcfnylaw.com>, Mark Gilliland <mg@markg.org>, Amy Kupferberg <artgirl22@earthlink.net>, Patricia Podolak <vze27vte@verizon.net>, christopher.crane@yahoo.com, annejaffeholmes@me.com, Susan Porcino <sporcino@hotmail.com>, Walter Rodriguez <wrodriguez@tasrc.com>, Peter Vitro <pobrod46@aol.com>, Bob McGloughlin <litmc2@aol.com>, JHOL49@aol.com, Ed Day <legislatorday@yahoo.com>, derfin@frontiernet.net

Health & Safety

Yesterday, there was an electrical "event" at Clarkstown High School North:
http://nanuet.patch.com/articles/students-evacuate-clarkstown-north-from-blown-transformer?ncid=newsltuspatc00000003#c

This incident serves as yet another reminder that problems with electrical facilities can and do happen.

Such was also the case at the Haverstraw substation, to which the proposed New City substation would be connected. Last August, this substation experienced an explosion and fire (http://twitter.com/RocklandFires/statuses/107823638459330560). Fortunately, it was not a catastrophic event, but do we wish to rely on luck and "wishful thinking," as evidenced by the failure of the Applicant to adequately address health and safety issues in their DEIS? We all know that luck and wishful thinking didn't work for O&R's emergency preparedness during Hurricane Irene and the October snowstorm last year, as Supervisor Gromack's sharply-worded

letter about the Applicant's major failures during these "events" highlighted (see attached & related story: http://www.lohud.com/article/20111104/NEWS03/111040372/Rockland-residents-lawmakers-assail-O-R-slow-response).

As I've previously stated, the lack of comprehensive and cumulative risk assessments in the DEIS, together with the lack of emergency planning, is very surprising, especially given the unique risks associated with the proposed site (residential neighborhood, heavily wooded, steep slopes nearby, drinking water source onsite, gas substation onsite, etc.).

I would also like to point out that while Mr. Coffey did provide a response to the information I supplied about the major explosion and fire in November 2009 at his company's Yonkers substation (albeit an inadequate response, in my opinion), I don't think he gave reasonably detailed information about the subsequent oil spill into the Bronx River nor he did not at all talk about the additional major explosion and fire that happened at the same facility in June 2010 (see attached) that I had raised at the first Public Hearing on the DEIS.

Accessory Uses of Substations

Although I don't have confirmation of this, I believe that O&R facilities may have been included on the EPA's "Superfund" list. If any O&R properties were on the included on the Superfund list -- especially substations, I would like O&R to identify those locations and what type of chemical spills would have caused them to be added to the list. My reason for seeking this information is to better understand possible future accessory uses of O&R's substations, such as material storage.

As an example, O&R had been using its Route 59 West Nyack substation to store large amounts of wire. Here is the Clarkstown Police Report about the theft of $50,000 of wire from that facility earlier in the year:

Burglary 2/23/12

On February 22, 2012 at approximately 9:00 am the Clarkstown Police responded to the Orange & Rockland Utility sub station at 195 Rt. 59 West Nyack on a report of a burglary. The complainant (project Engineer) reported when he arrived at work he noticed that there was been approximately 2,592 linear feet of copper wire valued at approximately $50,000 taken from their storage site. The last time the wire was observed was on January 25, 2012. The wire was described as Okonite 750 KCMIL insulated copper wire, 600 AMP Main Feeder. The wire was stored at the sub station until it was going to be used on a project at a later date. If anyone observed or has information of this incident are asked to contact the Clarkstown Police Department Detective Bureau at 639-5840

Here's the story about the arrest of a Stony Point man in this theft:
http://nanuet.patch.com/articles/stony-point-man-charged-in-50k-copper-wire-theft-from-o-r-in-west-nyack

I've seen wire stored at the Route 59 substation for a very long time -- possibly years. I would guess this facility has been used for storage on an "ongoing basis."

Last Friday, I drove past the Route 202 Haverstraw substation on the way to visit a relative and I noticed the gate was open. There was a pickup truck inside, along with what appeared to be one or two small storage trailers typically used by contractors. Also, I saw there were two portable bathrooms onsite.

Either the facility is undergoing some construction and/or it is being used on an ongoing basis as a bathroom facility for O&R's field personnel. My guess is that these port-a-johns are not part of any "site plan." So, I pose the following: 1) why are the port-a-johns at the Haverstraw facility; and 2) if there is construction going on, the Applicant should provide detailed information including copies of any narratives and permits (so that Clarkstown can determine if this relates to the proposed substation in New City).

Overall, the DEIS should discuss accessory uses of the planned substation in New City including chemical storage, wire storage, bathroom facilities, picnic/rest areas for company personnel, etc.

Thank you.

Sincerely,

Marvin Baum

~!~

2 attachments

Explosions & Fire in Yonkers.doc
32K

Letter from Alex Gromack on O&R Storm Response.pdf
150K

d:/c

Town of Clarkstown

Rosalie Amicucci <r.amicucci@clarkstown.org>

PSC Issues Notice of Probable Violation for O&R in January Gas Line Explosion

1 message

Marvin Baum <marvin@baumimagegroup.com> Mon, Jul 30, 2012 at 9:29 AM
To: s.thormann@clarkstown.org, Jose Simoes <j.simoes@clarkstown.org>, Bob Geneslaw <rgeneslaw@aol.com>, Amy Mele <a_mele@town.clarkstown.ny.us>, Shirley Lasker <shirlasker@aol.com>
Cc: Rosalie Amicucci <r.amicucci@clarkstown.org>, JHOL49@aol.com, Martus Granirer <martus@granirer.us>, Terri Thal <thal.terri@gmail.com>, "Walker, Kirsten" <kwalker@enduranceservices.com>, Mark Gilliland <mg@markg.org>, Amy M Kupferberg <artgirl22@earthlink.net>, Patricia Podolak <patricia.podolak@verizon.net>, annejaffeholmes@me.com, Chris Crane <christopher.crane@yahoo.com>, sporcino@hotmail.com, Walter Rodriguez <WRodriguez@tasrc.com>, derfin@frontiernet.net

The PSC has now indicated that O&R might have played a role in the terrible West Haverstraw gas explosion that took place in January. Until this point, only a Verizon subcontractor was criminally charged in that case. I had written to the Planning Board in June about this gas explosion and had warned that another such incident could take place, which it did about one week later in Nyack.

Here are the news reports about the Verizon subcontractor considering a change in his plea, based on new information from the PSC:

http://newyork.newsday.com/rockland/contractor-in-w-haverstraw-gas-blast-withdraws-guilty-plea-1.3863567

http://www.news12.com/articleDetail.jsp?articleId=328501&position=1&news_type=news

If O&R is found culpable of negligence in this case, it would be a surprising turn of events that further highlights the dangers of allowing them to install electric and gas substations on a single site in a residential neighborhood.

Sincerely,

Marvin Baum

Jose Simoes

From: Marvin S. Baum [marvin@baumimagegroup.com]

Sent: Thursday, December 17, 2009 12:47 PM

To: Jose Simoes; Amy Mele

Cc: Alex Gromack; Shirley Lasker; Shirley Thormann; George Hoehmann; Frank Borelli; Paula Tobin; Martus Granirer; Terri Thal; 'Harriet Cornell'; Ed Day; 'Justin Sweet'; Bob Jackson; Connie Coker; EsquireAW@aol.com; Phil Tisi; Peter Vitro; Arlene Miller; 'Anne Jaffe-Holmes'; Mark Gilliland ; Patricia Podolak; Thom Kleiner; ccoopersmith@orangetown.com; Michael Maturo, Councilman; Bea & Denis Troy; betsy&jon saetre; Dennis Letson; Chris Seidel

Subject: Pascack Road (Burns) Substation & Dramatic Fox News Video of Con Ed Substation Burning

On Wednesday, I drove past the Pascack Road (Burns) substation in Spring Valley, which is actually in Clarkstown, and noticed several "newer" survey markers. Because they will be extending Line 702 from this substation to the proposed new substation, in order to deliver more electricity to the proposed Tilcon substation in West Nyack, I previously speculated that they would need to upgrade this substation, in order to extend the transmission lines through Ramapo and Clarkstown. The survey markers are a very likely indication of a planned "upgrade," even though they haven't told Clarkstown about it.

It's ironic that the substation on Pascack Road is named the "Burns" substation. Take a look at one of their substations "burning" last month in Yonkers. First, there was a massive explosion, followed by the fire. The fire was out-of-control for two hours and Con Ed didn't even know that oil was spilled into the Bronx River (a mile and a half away) until a number of days later. Now, picture this explosion and fire happening on a very dry, hot summer day on South Mountain Road in an area surrounded heavily by trees, with rugged terrain (of the adjoining parklands) and the headwaters of the Hackensack watershed (our drinking water):

http://www.savetappan.com/?q=node/12

After seeing this video, it's easy to imagine a massive wildfire and the possibility of High Tor State Park and the nearby County park land being destroyed. Homes could also be destroyed… even the lives of local residents and our volunteer fire fighters could be put at risk – all in the name of increasing profits for both Con Edison and Tilcon. To top everything off… they want ratepayers to subsidize this project!

This video from Fox News is fairly dramatic… and it only happened days ago in Con Edison's own territory, so they can't make the excuse that it would never happen to them.

The total costs of O&R's upgrades may be well over $100 million (a single new substation on Line 702 in Orangetown is costing $30 million alone) and involve hundreds of acres of land!

How come nobody in Rockland County knew about this project and there has not been a full SEQR review???

What will the environmental consequences be for Clarkstown if this explosion happens in a heavily wooded area??? O&R needs a special permit from Clarkstown to build this substation. Why should this special permit be granted? O&R has tried to deceive the Town about the purpose of this substation, plus the potential "benefits" of this project for New City are trivial compared to the potential risks to our residents and impact on the neighboring towns.

I urge the Town to use the utmost caution in deciding on any approvals for O&R along Line 702.

Sincerely,

Marvin Baum
Baum Image Group, Inc.
(845) 353-3082

Jose Simoes

From: Marvin S. Baum [marvin@baumimagegroup.com]

Sent: Tuesday, December 15, 2009 11:45 AM

To: 'Harriet Cornell'; Alex Gromack; Amy Mele; Phil Tisi; John Edwards; Thom Kleiner; Arlene Miller; Jose Simoes; Shirley Lasker; Shirley Thormann; Bob Jackson; Ed Day; Connie Coker; Gerald Bierker; 'Martus Granirer'; 'Terri Thal'; ccoopersmith@orangetown.com; Michael Maturo, Councilman; Bea & Denis Troy; Marie Manning; George Hoehmann; Paula Tobin; JHOL49@aol.com; James Gallagher; Morty Golan; patandrita18; EsquireAW@aol.com; Ellen Jaffee; Frank Borelli; Dennis Letson

Subject: O&R Residential Ratepayers to Subsidize Large Commercial Customers Including Tilcon Expansion

Importance: High

As you'll see in the August 17, 2009, press release (below), O&R submitted a rate increase request to the New Jersey Board of Public Utilities. One of the justifications for the rate increase provided in the press release is the company's proposed infrastructure investments including a $1.6 million investment in the Harings Corner substation in Old Tappan, which is on Line 702. This means that there are at least 6 new or upgraded substation projects proposed along Line 702 in multiple municipalities in New York and New Jersey.

http://www.oru.com/aboutoru/news/2009081701.html

As Mr. McGoldrick indicated in his Affidavit, the purpose of the various upgrades along Line 702 are really just part of one big project, whose main goal is to deliver more electricity to several large customers in West Nyack including the Palisades Center, United Water and Tilcon. Because Tilcon already has a new temporary substation and has applied for a permanent substation to be built, it appears that they are really the driving force behind this project – and we'll all be paying for it in increased rates.

In an email yesterday to some of you, I speculated that the changes along Line 702 were really part of a system-wide upgrade in Rockland County. This now appears to be the case and is reflected in the following press release covering O&R's New Jersey territory:

http://www.oru.com/aboutoru/news/2009021001.html

In order to deliver more electricity to New Jersey, O&R will need to make a variety of upgrades throughout Rockland County, including new and extended transmission lines, as well as building new and upgraded substations, to get electricity from Bowline and Indian Point. Of course, they hadn't told anyone in Rockland about this.

The "kicker" in this whole thing, as indicated in the press release, is that all ratepayers will be footing the bill including the building the facilities and paying the property taxes on the substation sites, which O&R has positioned as benefitting the community when, in fact, the community will be paying those bills to subsidize the needs of a select group of customers. I'm sure that O&R's latest rate increases to the NYS PSC has or will include funding for similar "infrastructure" improvements in Rockland County, as well as to cover the cost of the property taxes for these facilities.

In essence, Rockland's many residential ratepayers will be funding the expansion of operations at Tilcon in West Nyack to help increase profits for Con Edison.

Now we know why our electric rates are among the highest in the nation!

Sincerely,

Marvin Baum
Baum Image Group, Inc.
(845) 353-3082

Jose Simoes

From: Marvin S. Baum [marvin@baumimagegroup.com]
Sent: Friday, December 18, 2009 1:09 AM
To: Dennis Letson; Amy Mele; Jose Simoes
Cc: Shirley Thormann; Shirley Lasker; George Hoehmann; Martus Granirer; Terri Thal; Arlene Miller; Phil Tisi; Alex Gromack
Subject: Tilcon's Snake Hill Road Substation Short EAF
Importance: High

In reviewing O&R's Short EAF today for the new Tilcon/West Nyack substation, I found that they indicated that the amount of land affected by this project in Question #7 to be 2.70 acres.

However, since the Affidavit of Mr. McGoldrick states that Line 702 will need to be extended from the Burns substation to the proposed South Mountain Road substation, in order to deliver an increased amount of electricity to Tilcon, the actual acres impacted is likely to be in the hundreds of acres over several miles.

As you all know, the Short EAF can only be used for Unlisted Actions. By definition, any project above 10 acres cannot use the Short EAF, and if the project involves park, open space and/or recreation land, that threshold is reduced to 2.5 acres. The proposed route of the extended Line 702 will almost certainly run right through the Davenport Preserve, reducing the threshold for this project, plus many of the impacted acres will not even be in the Town of Clarkstown, so that becomes a jurisdictional issue with the Town of Ramapo and the County of Rockland.

The bottom line is that the Tilcon substation will require a Full EAF, with notification of property owners along Line 702, regardless of the larger segmentation issue involving the South Mountain Road substation and other substation projects.

Sincerely,

Marvin Baum
Baum Image Group, Inc.
(845) 353-3082

XSTIXRJY - file

Town of Clarkstown

Rosalie Amicucci <r.amicucci@clarkstown.org>

E-mailed to PB & Council

Fw: "Gifts" from Con Edison to Government Employees (and vice versa) -- Issues with the Temporary Substation at South Mountain Road

1 message

j.simoes@clarkstown.org <j.simoes@clarkstown.org> Fri, Jul 20, 2012 at 1:16 PM
Reply-To: j.simoes@clarkstown.org
To: Rosalie Amicucci <r.amicucci@clarkstown.org>

Forward to PB and print for Rudy.
Leave me a copy on my desk.
Thanks.
Sent from my Verizon Wireless BlackBerry

From: "Marvin Baum" <marvin@baumimagegroup.com>
Date: Fri, 20 Jul 2012 12:19:00 -0400
To: 'Amy Mele'<a_mele@town.clarkstown.ny.us>
Cc: <s.thormann@clarkstown.org>; 'Jose Simoes'<j.simoes@clarkstown.org>; 'Shirley Lasker'<shirlasker@aol.com>; 'Bob Geneslaw'<rgeneslaw@aol.com>; Alex Gromack<a.gromack@clarkstown.org>; George Hoehmann<ghoehmann@msn.com>; Frank Borelli<fborelli@duceyinsurance.com>; Stephanie Hausner<Sghausner@gmail.com>; 'Martus Granirer'<martus@granirer.us>; 'Terri Thal'<thal.terri@gmail.com>; <JHOL49@aol.com>; 'Mark Gilliland'<mg@markg.org>; 'Amy M Kupferberg'<artgirl22@earthlink.net>; 'Patricia Podolak'<patricia.podolak@verizon.net>; 'Chris Crane'<christopher.crane@yahoo.com>; <annejaffeholmes@me.com>; <sporcino@hotmail.com>; 'Walter Rodriguez'<WRodriguez@tasrc.com>; Ed Day<legislatorday@yahoo.com>; 'Peter Vitro'<pobrod46@aol.com>; 'Bob McGloughlin'<litmc2@aol.com>; <derfin@frontiernet.net>
Subject: "Gifts" from Con Edison to Government Employees (and vice versa) -- Issues with the Temporary Substation at South Mountain Road

Dear Ms. Mele:

I had been unaware of recent collusion between Con Edison and government employees in a matter involving a NYC 2008 gas line explosion until I read the article below from a Syracuse newspaper (see link). Frankly, I've had my own personal concerns about the relationships of PSC employees with utility companies upon initially reading Case 04-E-0822 (about "vegetation management"), and just this month, again, upon reading O&R's new Transmission Vegetation Management Plan, which seems to provide almost 100% of what O&R wanted (even rescinding their "neighbor-friendly" modifications of 2008), despite the language of 10-E-0155 that seemed to seek a "balance."

The Syracuse article and the investigation by the Inspector General confirms that "inappropriate relationships" have indeed existed between New York's utilities, including Con Edison, and those who regulate them (specifically PSC employees, in those cases with National Grid and Con Edison).

This situation once again highlights Con Edison's aggressive efforts to "get what it wants." In this light, I want to express my significant concern that Con Edison has used a Town "procedure" to bypass SEQR to get their temporary substation installed at South Mountain Road. It's no wonder that they didn't copy their Building Department application for a temporary substation to the Planning Board because the narrative in

the attached document misleads the reader to believe that the Little Tor area and downtown New City are only serviced by one substation: the New Hempstead Substation.

As the Planning Board and the Town's planning consultants well know, these areas are part of the electrical grid and the DEIS for the permanent substation clearly states that these areas of New City are primarily serviced by three substations: Haverstraw, New Hempstead and Congers.

Indeed, if Little Tor and downtown New City were only service by a single substation... then the potential for a very short outage during the transfer of the distribution lines on New Hempstead Road would exist, just like my community had a planned outage several months ago when O&R upgraded some local equipment. But since New City is serviced by multiple substations, an outage, albeit short and minor, would be extremely unlikely to take place -- contrary to the assertion made in the Building Permit application. There is no way that this "temporary" substation would be needed for a minimum of two years, until the new substation is built, as stated in the O&R application, just to deal with the transfer of the lines on New Hempstead Road.

For O&R to state in the attached Building Permit application that this is a "Type II" emergency action and to further request approval "as soon as practical in order to provide Rockland County the assurance that their project (the New Hempstead Road upgrade) can go forward so New York State funding is not forfeited" are claims that are well beyond ridiculous. Nevertheless, by not involving/informing the Planning Department of their plans for a temporary substation, O&R appears to have fooled the Town into believing their ridiculous assertions.

What's really going on here? Obviously, O&R wanted to get a substation in place at the site of the proposed substation (for whatever reason) before a full and proper review was made under SEQR.

It this past year, O&R successfully transferred utility poles on Main Street in downtown New City and elsewhere, well before the temporary substation was in place and without any problems. The Building Department application, in my opinion, simply used the New Hempstead Road project as an excuse to get what they otherwise could not have gotten through the planning process and SEQR.

I am attaching a 1995 article from the New York Law Journal about Con Edison's criminal conviction in Federal Court and subsequent "corporate probation," as a reminder that this company has a history of hiding information from the public and behaving badly. Their more recent collusion with PSC employees on the 2008 gas line explosion and their submission to Clarkstown of what I believe is a knowingly misleading/false document, in order to obtain approval of the temporary substation, points to a continuing problem with the company.

Given these problems, I urge you to ask the Planning Department and the Town's Consultant for the proposed Little Tor Substation, Mr. Geneslaw, to thoroughly review O&R's Narrative and application for the temporary substation and also compare it the DEIS submitted by O&R for the permanent substation. I believe they will also conclude that the temporary substation approval was obtained to segment the permanent substation project and circumvent SEQR.

Please let me know the results of the Town's investigation as soon as possible.

Mr. Simoes: Please copy this email to all members of the Town's Planning Board, so that they can also be aware of this situation.

Thank you.

Sincerely,

Marvin Baum

From: K. Hilsberg [mailto:kh@heidelberry.com]
Sent: Friday, July 20, 2012 10:30 AM
To: Marvin Baum; 'Anne Jaffe-Holmes'; 'Walter Rodriguez'; sporcino@hotmail.com; Chris Crane; 'Patricia Podolak'; 'Amy M Kupferberg'; 'Mark Gilliland'
Subject: National Grid fined for gifts to PSC staff article

Good morning LORAX folks,

On the chance your local media is not covering this story, here is an excerpt from the front page article that appeared in our local newspaper, the Syracuse Post-Standard:

National Grid fined $1.6 million for improper gifts to state workers regulating the utility
Published: Wednesday, July 18, 2012

"Syracuse, N.Y. -- National Grid is expected to pay a $1.667 million penalty next month to settle charges that for years it plied workers at the state agency that regulates the utility with gifts including meals and rounds of golf. The gifts were uncovered during an investigation of Public Service Commission employees by state Inspector General Catherine Leahy Scott, who released her report today..."

Here is the link to read the entire article:
http://www.syracuse.com/news/index.ssf/2012/07/national_grid_fined_1_million.html
The link to the Inspector General's report is: http://ig.state.ny.us/pdfs/PSCPublicReport.pdf

By the way, the PSC recently sent a letter to our U.S. Senator's office stating that they had, as a courtesy, arranged for a meeting between me and National Grid to come to a resolution about my case (National Grid cutting down my farm's windbreak without an easement) and they then stated in the letter that I did not attend the meeting they arranged yet I continue to ask for their help. Interesting, because once again, this is not true. If they ever did make such arrangements, they never offered or informed me of such a meeting. Although I am sure you are not surprised to learn this, I thought you might find it interesting.

Sincerely,
Kay Hilsberg
Tel: 607-345-6105

~!~

2 attachments

'Narrative' 'Justification' for Building Permit for 'Tempoary' Mobile Transformer--06_JUL_2012.pdf
110K

Arnold & Porter LLP - Corporate Probation_ The Con Edison Sentence.pdf
126K

OHR/LITTLE TOR

Debbie Tretola

From: Rosalie Amicucci [r.amicucci@clarkstown.org]
Sent: Monday, July 23, 2012 9:53 AM
To: Gil Heim; Peter Streitman; Debbie Tretola; Mary Jane O'Connor; Mara Blumenthal; Amy Mele; Dennis Letson; Daniel Kraushaar; Charles Maneri
Subject: Fwd: Fw: "Gifts" from Con Edison to Government Employees (and vice versa) -- Issues with the Temporary Substation at South Mountain Road
Attachments: 'Narrative' 'Justification' for Building Permit for 'Tempoary' Mobile Transformer--06_JUL_2012.pdf; Arnold & Porter LLP - Corporate Probation_ The Con Edison Sentence.pdf

---------- Forwarded message ----------
From: <j.simoes@clarkstown.org>
Date: Fri, Jul 20, 2012 at 1:16 PM
Subject: Fw: "Gifts" from Con Edison to Government Employees (and vice versa) -- Issues with the Temporary Substation at South Mountain Road
To: Rosalie Amicucci <r.amicucci@clarkstown.org>

Forward to PB and print for Rudy.
Leave me a copy on my desk.
Thanks.
Sent from my Verizon Wireless BlackBerry

From: "Marvin Baum" <marvin@baumimagegroup.com>
Date: Fri, 20 Jul 2012 12:19:00 -0400
To: 'Amy Mele'<a_mele@town.clarkstown.ny.us>
Cc: <s.thormann@clarkstown.org>; 'Jose Simoes'<j.simoes@clarkstown.org>; 'Shirley Lasker'<shirlasker@aol.com>; 'Bob Geneslaw'<rgeneslaw@aol.com>; Alex Gromack<a.gromack@clarkstown.org>; George Hoehmann<ghoehmann@msn.com>; Frank Borelli<fborelli@duceyinsurance.com>; Stephanie Hausner<Sghausner@gmail.com>; 'Martus Granirer'<martus@granirer.us>; 'Terri Thal'<thal.terri@gmail.com>; <JHOL49@aol.com>; 'Mark Gilliland'<mg@markg.org>; 'Amy M Kupferberg'<artgirl22@earthlink.net>; 'Patricia Podolak'<patricia.podolak@verizon.net>; 'Chris Crane'<christopher.crane@yahoo.com>; <annejaffeholmes@me.com>; <sporcino@hotmail.com>; 'Walter Rodriguez'<WRodriguez@tasrc.com>; Ed Day<legislatorday@yahoo.com>; 'Peter Vitro'<pobrod46@aol.com>; 'Bob McGloughlin'<litmc2@aol.com>; <derfin@frontiernet.net>
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Transmission Vegetation Management Plan, which seems to provide almost 100% of what O&R wanted (even rescinding their "neighbor-friendly" modifications of 2008), despite the language of 10-E-0155 that seemed to seek a "balance."

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As the Planning Board and the Town's planning consultants well know, these areas are part of the electrical grid and the DEIS for the permanent substation clearly states that these areas of New City are primarily serviced by three substations: Haverstraw, New Hempstead and Congers.

Indeed, if Little Tor and downtown New City were only service by a single substation... then the potential for a very short outage during the transfer of the distribution lines on New Hempstead Road would exist, just like my community had a planned outage several months ago when O&R upgraded some local equipment. But since New City is serviced by multiple substations, an outage, albeit short and minor, would be extremely unlikely to take place -- contrary to the assertion made in the Building Permit application. There is no way that this "temporary" substation would be needed for a minimum of two years, until the new substation is built, as stated in the O&R application, just to deal with the transfer of the lines on New Hempstead Road.

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Given these problems, I urge you to ask the Planning Department and the Town's Consultant for the proposed Little Tor Substation, Mr. Geneslaw, to thoroughly review O&R's Narrative and application for the temporary substation and also compare it the DEIS submitted by O&R for the permanent substation. I believe they will also conclude that the temporary substation approval was obtained to segment the permanent substation project and circumvent SEQR.

Please let me know the results of the Town's investigation as soon as possible.

Mr. Simoes: Please copy this email to all members of the Town's Planning Board, so that they can also be aware of this situation.

Thank you.

Sincerely,

Marvin Baum

From: K. Hilsberg [mailto:kh@heidelberry.com]
Sent: Friday, July 20, 2012 10:30 AM
To: Marvin Baum; 'Anne Jaffe-Holmes'; 'Walter Rodriguez'; sporcino@hotmail.com; Chris Crane; 'Patricia Podolak'; 'Amy M Kupferberg'; 'Mark Gilliland'
Subject: National Grid fined for gifts to PSC staff article

Jose Simoes

From: Marvin S. Baum [marvin@baumimagegroup.com]
Sent: Friday, December 18, 2009 12:04 PM
To: Amy Mele; Dennis Letson; Jose Simoes
Cc: ccoopersmith@orangetown.com; Arlene Miller; Phil Tisi; Shirley Lasker; Shirley Thormann; Bea & Denis Troy; Michael Maturo, Councilman; Connie Coker; John Edwards; George Hoehmann; 'Martus Granirer'; Terri Thal; JHOL49@aol.com; tasull13@aol.com; Donks13@aol.com; James Gallagher
Subject: Answers on SEQR for Line 702 System Upgrades in Orangetown, Clarkstown, Ramapo and Old Tappan

I realize that I've been providing each of you with a tremendous amount of information and you may be in "overload" right now, but the scale and scope of the projects O&R has proposed is massive and since O&R's intent is to have these projects approved as quickly as possible in early 2010, I feel that it's necessary to get you this information now.

The SEQR Handbook provides a basic test for segmentation. The "SEQR test" questions (and answers in this case) are as follows:

- *Purpose: Is there a common purpose or goal for each segment?* In the case of the Line 702, the stated goal of Mr. McGoldrick in his Affidavit is to deliver more electricity on this line from the proposed South Mountain Road substation to several large customers in West Nyack for which it has submitted a separate proposal specifically for a Tilcon substation and will require a separate project to upgrade the Route 59 West Nyack substation and most likely the Burns substation, along with extending Line 702 through Ramapo back into Clarkstown. Having now read the narratives for both the Tilcon and South Mountain Road projects, neither mentions the other. The South Mountain Road narrative, while mentioning Tilcon, is referring to the nearby Tilcon operation in Haverstraw, not West Nyack. There is no indication whatsoever in either narrative that the South Mountain Road substation is needed to deliver more electricity to Tilcon in West Nyack for what the Tilcon narrative describes as Tilcon's "undertaking an expansion of their load in the near future," nor does either narrative explain exactly what Tilcon's "expansion" is or how it will impact the environment. Neither narrative

mentions the necessary extension of Line 702, which has major environmental implications. Neither narrative states whether the poles and transmission lines on Line 702 will be changed and/or upgraded beyond 138kV, and the potential implications of these changes, including increase EMF exposure. Only the Affidavit of Mr. McGoldrick reveals the true intentions of Orange & Rockland's massive upgrade project.

- *Time: Is there a common reason for each segment being completed at or about the same time.* In this case, the answer is absolutely yes. Mr. McGoldrick states that when the South Mountain Road substation comes online in 2010, which is also the year that the Tilcon substation will come online, "several large customers will be directly served by Line 702." Without the Tilcon substation and changes to Route 59 West Nyack substation, it would not be possible for Line 702 to provide service to these "several large customers." Similarly, the Verizon and Harings Corners substations will be coming online at approximately the same time. This is not a coincidence.
- *Location: Is there a common geographic location involved?* Again, the answer is yes – that geographic location is Line 702 that ties together at least 5-6 new or upgraded substations with a total construction cost that is likely well in excess of $60 million.
- *Impacts: Do any of the activities being considered for segmentation share a common impact that may, if the activities are reviewed as one project, result in a potentially significant adverse impact?* The common impact is on Line 702 property owners. Independently, these projects are positioned as being smaller projects on small parcels of land with a limited number of neighbors being impacted. The Tilcon West Nyack project uses a Short Environmental Assessment Form, which can only be used for project of less than 10 acres. In question #7, the acreage is given as 2.70 acres, but if all of the properties along the existing Line 702 and proposed Line 702 extension are considered, based on O&R's own admission that this transmission line will be critical to delivering more electricity to Tilcon, the Palisades Center and United Water, then the Line 702 properties are indeed subject to SEQR review on this point alone.
- *Ownership: Are the different segments under the same ownership or control.* Without

question, the existing and proposed extended Line 702, and the new substations and upgraded stations are under the same ownership and control of Con Edison's Orange & Rockland Division.

- *Planning: Is a given segment a component of an identifiable overall plan? Will the initial phase direct the development of subsequent phases or will it preclude or limit the consideration of alternatives in subsequent phases?* The answer to all of these questions is "yes." Once approval is given to the Harings Corning, Verizon, South Mountain Road and Tilcon substation projects, consideration of alternatives for the upgrades to the West Nyack and Burns substations, the extension of Line 702 and the upgrades to the towers and lines along the existing route of Line 702 will be severely limited.
- *Utility: Can any of the phases of the various projects be considered functionally dependent on each other?* Mr. McGoldrick makes exceedingly clear in his Affidavit that the delivery of increased electricity to meet the needs of Tilcon, Palisades Center and United Water is absolutely dependent upon the building of the South Mountain Road substation and the extension of Line 702.
- *Inducement: Does the approval of one phase or segment commit the agency to approve the other phases?* The answer is yes because of the massive expense associated with these substation projects are ultimately charged to ratepayers. If the $50 or $100 million spent on Line 702 upgrades can't be utilized, it will be a tremendous burden on ratepayers without yielding even the smallest of benefits. This is the reason why the approval of one phase or segment of the Line 702 upgrade will, in essence, force the approving agencies to approve other segments of the project.

Needless to say, the "SEQR test" proves that this project has segmented, in violation of SEQR, and each of the municipalities should carefully consider this before granting any approvals to any projects.

Sincerely,

Marvin Baum

Note. e-mailed to PB's Consultants

file

Town of Clarkstown

Rosalie Amicucci <r.amicucci@clarkstown.org>

X294, X57

Fwd: Additional Document Regarding O&R New City Substation and United Water Desalination Plant

1 message

Jose Simoes <j.simoes@clarkstown.org> Tue, Jul 24, 2012 at 9:12 AM
To: Rosalie Amicucci <r.amicucci@clarkstown.org>

---------- Forwarded message ----------
From: **Marvin Baum** <marvin@baumimagegroup.com>
Date: Mon, Jul 23, 2012 at 11:55 AM
Subject: Additional Document Regarding O&R New City Substation and United Water Desalination Plant
To: a.mele@clarkstown.org
Cc: s.thormann@clarkstown.org, Jose Simoes <j.simoes@clarkstown.org>, Bob Geneslaw <rgeneslaw@aol.com>, Shirley Lasker <shirlasker@aol.com>, Martus Granirer <martus@granirer.us>, Terri Thal <thal.terri@gmail.com>, p kurtz <pkurtz9@gmail.com>, JHOL49@aol.com, Peter Vitro <pobrod46@aol.com>, Bob McGloughlin <litmc2@aol.com>, Mark Gilliland <mg@markg.org>, Amy M Kupferberg <artgirl22@earthlink.net>, Patricia Podolak <patricia.podolak@verizon.net>, annejaffeholmes@me.com, Chris Crane <christopher.crane@yahoo.com>, sporcino@hotmail.com, Walter Rodriguez <WRodriguez@tasrc.com>, "Walker, Kirsten" <kwalker@enduranceservices.com>, Ed Day <legislatorday@yahoo.com>, Harriet Cornell <cornellh@optonline.net>, George Hoehmann <ghoehmann@msn.com>, Frank Borelli <fborelli@duceyinsurance.com>, Stephanie Hausner <Sghausner@gmail.com>, Alex Gromack <a.gromack@clarkstown.org>

Dear Ms. Mele:

I forgot to include a copy of the United Water DEIS' energy review with my last email to you regarding O&R's temporary substation and proposed permanent substation, which I am now attaching. This is especially relevant for the proposed New City substation, and segmentation, once again, is at issue.

Here's the key to this issue on page 17 of the United Water DEIS:

*Accounting for variations in salinity and seasonal water production, the annual average energy consumption for the water treatment plant is estimated at 17,400 MWh, as shown in **Table 11-3**. Assuming a higher average salinity and higher average temperature such as might occur as a result of global climate change, the annual average energy consumption is estimated at 18,300 MWh. This is within O&R norms for industrial premises. According to meetings and discussions with O&R, with the localized upgrades discussed above, there is ample capacity within O&R's system to meet the energy demands of the Proposed Project.*

The West Haverstraw substation, according to the O&R DEIS (also attached) for the proposed New City substation, currently services northern New City, along with the New Hempstead and Congers substations. This is the information O&R failed to include in the permit application for the temporary substation in order to create their "blackout" scenario to justify the temporary substation as a Type II "Emergency Action" under SEQR. You can see the service area map with the existing substations on Page 25 of the attached O&R DEIS.

Here's one of the claims from the O&R DEIS:

Don't you find it strange that O&R can add a desalination plant (17,400 - 18,300 MWh annually) to its existing West Haverstraw facility that currently services New City, yet O&R claims that this same substation (together with two others) can't meet the so-called "growing demand" of a built-out residential area despite increasing efficiencies of the devices people are using (front-load washers, LED/CFL bulbs, low-energy computers and mobile devices, etc.)?

Here, again, on page 184 of the O&R DEIS, O&R states that the Little Tor area is serviced by three substations, not just New Hempstead as they falsely implied to get their building permit from the Town for the temporary substation:

Why can the West Haverstraw substation no longer supply the local demands of New City residents and small businesses, yet is able to supply the massive local demand of a desalination plant?

On page 185, O&R indicates that they'll be moving Tilcon's dedicated transformer (20 MW) from West Haverstraw to the proposed New City substation, which will be 20% of the proposed substation's 100 MW capacity:

O&R claims that building the New City substation is a reliability issue for Tilcon and also claims that New City residents will experience a degradation of both voltage and reliable service if it's not built. They say the New City substation will "free the lines" to provide backup to both locations. They don't say it will "free the lines" to provide electrical service to a desalination plant and provide backup to that plant.

What it appears they're not telling the Town is that they want to off-load both Tilcon and northern New City electrical users to make way for the needs of this new desalination plant at the existing West Haverstraw substation facility.

At this point, I think I've demonstrated serious credibility issues with O&R including a false/misleading permit application to the Town for a temporary substation, false/misleading photo simulations in the New City substation DEIS and a prior criminal conviction of Con Edison for withholding information from the public.

Therefore, in addition to conducting an investigation of O&R's application (and I believe improper approval) for the temporary substation, I think the Town has an obligation to thoroughly research the connection between the energy usage of the proposed United Water desalination plant and the need for the proposed New City substation.

Joe Simoes: **Please copy this email to the members of the Clarkstown Planning Board.**

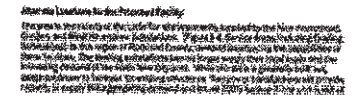
Thank you.

Sincerely,

Marvin Baum

~!~

5 attachments



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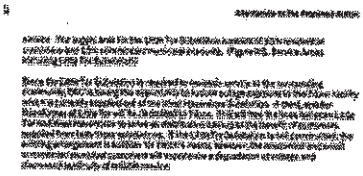

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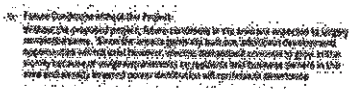

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DEIS_11_Infrastructure and Energy.pdf
151K

DEIS~184.pdf
13587K

Jose Simoes

From: Marvin S. Baum [marvin@baumimagegroup.com]

Sent: Tuesday, January 05, 2010 10:05 AM

To: Jose Simoes; Amy Mele; Dennis Letson

Cc: 'Martus Granirer'; Terri Thal; Donks13@aol.com; tasull13@aol.com; Shirley Lasker; George Hoehmann; Shirley Thormann; Bea & Denis Troy; Phil Tisi; Connie Coker; Ed Day; Bob Jackson; Michael Maturo, Councilman; Arlene Miller; 'Harriet Cornell'; Alex Gromack; ccoopersmith@orangetown.com

Subject: ECI Retained by Con Edison

According to my sources in Westchester, "ECI" was apparently retained by Con Edison in connection with their disastrous tree removal operations during the past few months. Aside from transmission line "clearance" operations, one of ECI's other "specialties" is finding multiple uses for transmission line ROWs to "enhance" profitability. Here's what the ECI website says:
Significant societal and economic benefits accrue through multiple uses of electric transmission rights-of-way (ROWs). However, authorization of multiple ROW uses has the potential to be detrimental to the safe, reliable transmission of electricity. Research conducted by ECI for the Electric Power Research Institute (EPRI) is providing information to help utilities better evaluate the myriad of current and potential ROW uses, establish effective protocols, and identify the best opportunities for appropriate expansion of ROW uses.

http://www.eci-consulting.com/fp.php

Some of the off-right-of-way tree removals (on NYC DEP lands) in Westchester were bizarre, which has created serious questions about why this was done. Perhaps, ECI's other "specialty" about additional ROW uses provides an answer.

As things "move forward" in the coming weeks on O&R's segmented projects (in violation of SEQR), it's important for everyone to ask questions about the company's future development plans for their right-of-ways and to understand how it might impact our communities and residents.

We must all be extremely vigilant in dealing O&R, a division of Con Edison, and **keep in mind that we are dealing with a "convict."** In 1994, Con Edison was convicted in Federal Court of criminally circumventing environmental and right-to-laws. Judge John Martin assessed the maximum $2 million fine and imposed a three-year "monitor" on Con Edison to ensure compliance with environmental laws. Apparently, with their attempts to violate SEQR in Rockland County, Con Edison has reverted to its "old ways."

Sincerely,

Marvin Baum
(845) 353-3082

Jose Simoes

From: Marvin S. Baum [marvin@baumimagegroup.com]
Sent: Sunday, December 13, 2009 3:26 PM
To: Jose Simoes
Cc: Dennis Letson; Amy Mele; Shirley Thormann; Arlene Miller; Phil Tisi; Martus Granirer; Terri Thal; Ellen Jaffee; 'Harriet Cornell'; John Edwards
Subject: Con Edison Substation Oil Spills & Additional Info on O&R Substations in Ramapo & Clarkstown
Importance: High
Attachments: JN Article on Bronx River Oil Spill 11-17-09.doc; From Tremont Tribune.doc

Dear Joe:

I am attaching news stories for you about the recent oil spill by Con Edison into the Bronx River from one of their substations. This also wasn't the first time Con Edison spilled oil into the Bronx River.

Fortunately, no one drinks water from the Bronx River in the Bronx, but the proposed O&R substations at Tilcon in West Nyack and the substation that it needs at South Mountain Road to feed this substation are unfortunately very close to our drinking water supply. As you'll see in the attached articles, it took a number of days before the oil actually showed up in the river. I happened to drive by the clean-up site along the Bronx River Parkway in November, which is how I first learned about this problem.

Has O&R presented emergency response plans to Clarkstown as part of its plans to prevent this from ever happening? How will we prevent oil from getting into our drinking water, should there be a fire at any of the proposed substations?

I've also now learned about what appears to be a relatively new substation in Ramapo that might well be part of O&R's Line 702 "upgrade/extension" project to deliver more electricity to Tilcon in West Nyack and the many other unspecified customers referred to in Mr. McGoldrick's Affidavit. This substation is right in the middle of the satellite photo below. In order to extend Line 702 to New City from Spring Valley, based on the description in his Affidavit, I'm almost certain it would go through this substation, which I'm guessing was designed for this purpose, as well as to deliver more electricity to the neighboring New Square.

The impact of the upgrade of the existing transmission lines through the residential neighborhoods of Ramapo near West Eckerson Road could be very substantial, if these line are converted to "federally regulated" lines above 200KV. Depending on the right-of-way easements that exist, many people could see virtually every tree cut down on their properties, as recently happened in Westchester and that previously happened in Blauvelt. What would this do to property values of the impacted homes?

The people of Ramapo have a right-to-know how projects in Clarkstown will impact them, including on their health, their homes, their property values, their environment, etc. The problem right now is that we don't really know what O&R's plans are because they've withheld this information from everyone.

If I can take a "wild guess"... there is either a plan or will be a plan before the Village of Spring Valley or Ramapo Planning Board (I don't know which agency has jurisdiction in this matter) to upgrade the Burns Substation off of Pascack Road to complete this highly segmented project, in violation of SEQR.

COPIED FOR PB MTG. ON 6/6/12

Town of Clarkstown

Jose Simoes <j.simoes@clarkstown.org>

Follow-Up Re: South Mountain Road Substation

1 message

Marvin Baum <marvin@baum.tv> Fri, May 25, 2012 at 1:27 PM
To: Shirley Thormann <s.thormann@clarkstown.org>
Cc: Rosalie Cautillo <r.cautillo@clarkstown.org>, Jose Simoes <j.simoes@clarkstown.org>, Bob Geneslaw <rgeneslaw@aol.com>, Shirley Lasker <shirlasker@aol.com>, Terri Thal <thal.terri@gmail.com>, Martus Granirer <martus@granirer.us>, "Walker, Kirsten" <kwalker@enduranceservices.com>

Dear Ms. Thormann:

I am attaching copies of the articles about the Con Edison, Inc., substations in NYC and Westchester that I quoted at the recent Clarkstown Planning Board meeting on the proposed South Mountain Road substation by the Applicant, a division of Con Edison. Both of these substations had the explosions and fires on the very weekend before the Public Hearing. As I stressed at the meeting, the euphemistic language, descriptions of risks and emergency planning in the O&R DEIS were totally inadequate.

In my presentation, I also referred to several other explosions and fires experienced by Con Edison, Inc., including a massive explosion and fire in November 2009 at the Dunwoodie Substation in Yonkers, which was followed by an oil spill in the Bronx River two miles away as a result of this fire. Several months later in June 2010, that substation experienced another explosion/fire. I am attaching articles and photos about the first Dunwoodie "event" and subsequent oil spill.

Other major explosions and fires at substations have taken place in recent weeks and months at other utility company substations across the country including in Edison (http://www.nj.com/news/index.ssf/2012/02/edison_transformer_fire_shoots.html), Boston (http://www.reuters.com/article/2012/03/14/us-boston-fire-idUSBRE82D0DS20120314), Portland (http://www.wmtw.com/Substation-Fire-Causes-Portland-Power-Outage/-/8792672/9569452/-/11x0ue0z/-/index.html) and New Orleans (http://www.fox8live.com/story/18406268/fire-at-power-substat). The most recent substation fire took place just hours ago in Ashville and was caused by a black snake: (http://www.citizen-times.com/article/20120525/NEWS/305240057/Black-snake-blamed-electrical-substation-fire-near-Asheville?odyssey=tab%7Ctopnews%7Ctext%7CFrontpage)

Here are the two videos that I showed at the meeting of substation explosions and fires:

http://youtu.be/WkDCS8xeobg

http://youtu.be/pdDolznk9eY

With the dangers demonstrated by these videos, the links to recent substation "events," and the attached articles, I have a particular concern about the proposed location, which will also be the site of a gas line regulator. Take a look at what happened some years ago in Edison, NJ: http://www.youtube.com/watch?v=NyMbaZ9FVjA

More recently, a massive deadly gas line explosion took place in California: http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2010/09/09/BADP1FBJRS.DTL

The O&R DEIS does not at all address the potential risks associated with the co-location of the substation and gas regulator facilities. Do these two facilities together pose an increased risk to the safety of residents in Clarkstown that either would if located separately? I would like to request that this question be addressed by the Planning Board.

Also, I'd like to request that this email be forwarded to all members of the Clarkstown Planning Board so that they can review these materials.

Thank you very much.

Sincerely,

Marvin Baum

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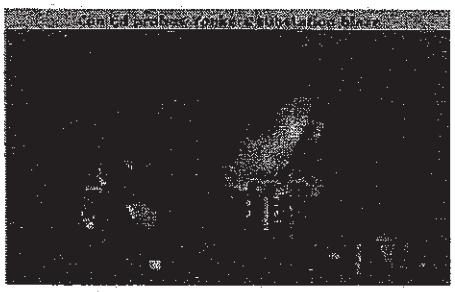
12 attachments



ScreenHunter_10 Dec. 19 21.53.jpg
18K

Town of Clarkstown

Rosalie Cautillo <r.cautillo@clarkstown.org>

FW: South Mountain Road Substation DEIS Review at Clarkstown Planning Board

1 message

Marvin Baum <marvin@baum.tv> **Fri, Mar 2, 2012 at 10:01 AM**
To: Shirley Thormann <s.thormann@clarkstown.org>
Cc: Jose Simoes <j.simoes@clarkstown.org>, Rosalie Cautillo <r.cautillo@clarkstown.org>, Alex Gromack <a.gromack@clarkstown.org>

I didn't realize the Clarkstown email addresses had changed, so I'm now resending my email below to you.

Thanks for your consideration.

Sincerely,

Marvin

Marvin Baum

From: Marvin Baum [mailto:marvin@baum.tv]
Sent: Friday, March 02, 2012 1:40 AM
To: Shirley Thormann (s_thormann@town.clarkstown.ny.us)
Cc: Shirley Lasker (shirlasker@aol.com); Martus Granirer (martus@granirer.us); Terri Thal (thal.terri@gmail.com); Bob McGloughlin (litmc2@aol.com); Peter Vitro (pobrod46@aol.com); Ed Day (legislatorday@yahoo.com); Jose Simoes (j_simoes@town.clarkstown.ny.us); Rosalie Cautillo (r_cautillo@town.clarkstown.ny.us); 'mg@markg.org'; Alex Gromack (a_gromack@town.clarkstown.ny.us); David Warner
Subject: South Mountain Road Substation DEIS Review at Clarkstown Planning Board

Dear Chairwoman Thormann:

This coming Wednesday, March 7th, at 7:00PM, the Clarkstown Planning Board will be reviewing

O & R Utilities' DEIS submission for the proposed substation on South Mountain Road, which is a Town-designated historic road. In the past, I believe this issue has generated significant public interest.

The Planning Board hearing coincides with the beginning of the Jewish festival of Purim and the conclusion of the Fast of Esther at 6:49pm. Purim is a very widely celebrated holiday in all Jewish denominations (Reform, Conservative and Orthodox), and many will be attending services and children's programming that evening.

As you are well aware, Clarkstown (and northern New City, in particular) has a large Jewish population. Given the interest level in the proposed substation, it seems that if the meeting were to be held as planned, some people might need to choose between an important public matter and their own personal religious observance. Aside from simply being a fun holiday, in the Jewish faith it is considered to be very important (a significant "mitzvah") to hear every word of the public reading of the story of Esther. And for those who participate in the Fast that end moments before this DEIS review, attendance at the Planning Board meeting would be an even bigger burden.

Here is the background/context of the holiday: http://www.chabad.org/holidays/purim/article_cdo/aid/648312/jewish/Purim-2012-Guide.htm

As a Con Edison shareholder, I am certain the company would not want a review of this project to conflict with the community celebration of Purim nor preclude people of the Jewish faith, so I ask that you consider a postponement of the O&R DEIS review to a later date.

Thank you very much.

Sincerely,

Marvin

Marvin Baum

Town of Clarkstown

Rosalie Amicucci <r.amicucci@clarkstown.org>

New Data: Prenatal EMF Exposures Can Lead to Childhood Obesity + Impacts of EMF on Asthma (Consideration for Proposed New City Substation)

1 message

Marvin Baum <marvin@baumimagegroup.com> Fri, Jul 27, 2012 at 6:37 PM
To: s.thormann@clarkstown.org, Shirley Lasker <shirlasker@aol.com>, Jose Simoes <j.simoes@clarkstown.org>, Bob Geneslaw <rgeneslaw@aol.com>, a.mele@clarkstown.org
Cc: Martus Granirer <martus@granirer.us>, Terri Thal <thal.terri@gmail.com>, Mark Gilliland <mg@markg.org>, Amy M Kupferberg <artgirl22@earthlink.net>, Patricia Podolak <patricia.podolak@verizon.net>, annejaffeholmes@me.com, Chris Crane <christopher.crane@yahoo.com>, sporcino@hotmail.com, Walter Rodriguez <WRodriguez@tasrc.com>, JHOL49@aol.com, Rosalie Amicucci <r.amicucci@clarkstown.org>, Harriet Cornell <cornellh@optonline.net>, "Walker, Kirsten" <kwalker@enduranceservices.com>, George Hoehmann <ghoehmann@msn.com>, Frank Borelli <fborelli@duceyinsurance.com>, Stephanie Hausner <Sghausner@gmail.com>, Ed Day <legislatorday@yahoo.com>, Alex Gromack <a.gromack@clarkstown.org>, p kurtz <pkurtz9@gmail.com>, Microwave News <info@microwavenews.com>

As Clarkstown begins to evaluate the EMF health impacts of the existing transmission lines and the proposed New City substation along South Mountain Road, it is important to look at the latest peer-reviewed scientific/medical information on this subject. I made this exact point at several of the public hearings and in my follow-up emails.

According to information I received today from Dr. Louis Slesin, an expert on EMF issues and publisher of Microwave News, Dr. De-Kun Li, MD, an epidemiologist at Kaiser Permanente in Oakland, California, has a new paper out showing that EMF exposures in the womb are linked to an increased risk of childhood obesity.

"Maternal exposure to high [magnetic fields] during pregnancy may be a new and previously unknown factor contributing to the world-wide epidemic of childhood obesity/overweight," Li writes in a paper posted today by Scientific Reports, a peer-reviewed, open access journal owned by the group that publishes Nature.

I've attached a copy of the story and you can also read it at:

http://microwavenews.com/news-center/emf-exposures-womb-can-lead-childhood-obesity

Last year, Dr. Li linked EMF exposure to asthma in an article published in the Journal of the American Medical Association (JAMA). A copy of this article is attached.

Obesity and childhood asthma are among the biggest public health issues today for children. These newer studies in some of the most prestigious medical and scientific publications, in addition to the various studies I've already provided to the Town (like the Oxford University Childhood Cancer Research Center study linking EMF exposure to Childhood Leukemia), warrant close consideration by medical experts prior to any approval by the Town of the O&R application for a special permit to build an electrical substation in a residential neighborhood. As I've stated previously, while I have highest regard for Town's electrical engineering consultant, Mr. Leifer, both personally and professionally, I do not believe he has the

appropriate expertise/experience to evaluate this data from a medical perspective. Therefore, the Town must retain medical experts for this purpose.

Rosalie: Please forward this email and the attached studies to the Planning Board members.

Thank you.

Sincerely,

Marvin Baum

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2 attachments

Microwave News _ EMF Exposures in the Womb Can Lead to Childhood Obesity.pdf
60K

JAMA Network _ Archives of Pediatrics & Adolescent Medicine _ Maternal Expos.pdf
269K

file O&R Letter from Baum (6/14)

Debbie Tretola

From: Marvin Baum [marvin@baumimagegroup.com]
Sent: Thursday, June 14, 2012 2:11 PM
To: s.thormann@clarkstown.org; 'Jose Simoes'; 'Shirley Lasker'; 'Martus Granirer'; 'Terri Thal'; 'Mark Gilliland'; 'Patricia Podolak'; artgirl22@earthlink.net; christopher.crane@yahoo.com; annejaffeholmes@me.com; 'Susan Porcino'; 'Walter Rodriguez'; 'Walker, Kirsten'; JHOL49 @aol.com; 'Peter Vitro'; 'Bob McGloughlin'; 'Bob Geneslaw'; derfin@frontiernet.net; a.mele@clarkstown.org; 'Walker, Kirsten'; Rosalie Cautillo
Cc: Anthony Montalbano; David Warner
Subject: Documents Related to My Presentations on the O&R New City Substation DEIS
Attachments: San Bruno fire levels neighborhood - gas explosion.pdf; Contractor Cited For Error Pleads Guilty In West Haverstraw Gas Blast - New .pdf; West Haverstraw blast probes seek wrongdoing; Cortlandt company workers inte.pdf; Childhood cancer in relation to distance from high volta... [BMJ. 2005] - Pu.pdf; Childhood leukaemia and Downs Syndrome.pdf; AN ACT CONCERNING ELECTRIC TRANSMISSION LINE SITING CRITERIA..pdf; Microwave News _ Faulty DNA Repair May Explain EMF Role in Childhood Leukemi.pdf; PSE&G's Solar 4 AllTM Program.pdf; The bi-partisan NY Solar Jobs Act continues to... - NRDC.pdf; NY-Support-for-Renewables-Executive-Summary-Memo-D1b_5_25.pdf; Securing & Upgrading the Grid.pdf; Javits1967.pdf; Underground New Square Transmission Lines.pdf; Close-In of New Square.pdf; ParkSubinTDWorld.pdf; Marvin's Pages From Substation DEIS.pdf; 2008 McMahon Speech -- Final.doc; O&R Press Release on New City Substation.doc

I am attaching various documents that I used in support of my presentation to the Clarkstown Planning Board on June 6, 2012, as well as in support of my follow-up email yesterday that was read into the record by Terri Thal, since I was unable to attend last night's meeting.

The first three attached documents talk about gas line explosions -- one massive deadly explosion in San Bruno, CA, in 2010, and one more recently on an O&R gas line in nearby West Haverstraw, which fortunately was not deadly because the homeowners weren't home at the time. The Haverstraw story demonstrates how easily something could (and did) go wrong because a utility contractor didn't follow proper procedures. Given the inherent risks of explosion and fire that I've shown is possible at electrical substations (in my May presentation), the question needs to be answered by the DEIS about the cumulative risks of co-locating a gas regulator or gas substation at the same site, which could make the proposed project even more dangerous for the public's health and safety than each facility would do independently of the other.

The next set of four documents cover the relationship between EMF exposure and childhood Leukemia. O&R's DEIS claimed there are no health risks whatsoever. The strong countering evidence on this issue needs to be addressed by the DEIS.

One of these attached documents is a study posted by our National Library of Medicine that comes from the British Medical Journal. This Oxford University Childhood Cancer Research Center study of 9700 children with childhood Leukemia found a significant increase in this disease when patients lived near transmission lines at time of birth. Substations generate similar EMFs, and the proposed New City substation will only increase the public's existing EMF exposure above and beyond the existing transmission lines.

The O&R DEIS proposes a project that will perpetuate an antiquated electrical distribution system design. It does not consider clean, local alternatives such as New Jersey is already pursuing on a large scale. In PSE&G's territory alone, the company will be generating 80 megawatts of solar power by the end of the year -- enough to power 13,000 homes! Four attached documents show how solar and other local alternatives not considered in the DEIS could potentially meet future demand in New City, along with Clarkstown's consideration of a solar farm in West Nyack at the old landfill site to meet the Town's overall needs.

At the June 6th meeting, O&R claimed that its transmission system was a completely "above ground" system, with the exception of a small underground transmission line installation in Orangeburg for Verizon. Therefore, they indicated that putting the transmission lines and substation underground in New City are not something that could not be considered. Starting with a 1967 letter from Senator Jacob Javitz regarding the need to put transmission lines underground, I have attached several documents about underground transmission facilities to demonstrate the feasibility of such projects that significantly reduce EMF exposure and offset aesthetic and property value impacts. Two of these documents include satellite photos of New Square, NY, where all transmission lines were put underground by O&R -- just a short distance away from the proposed substation, so clearly this approach is a feasible alternative that simply hasn't been considered in the DEIS.

Lastly, I have attached some pages from the substation DEIS, an annual meeting speech (indicating that this substation is a segment of a bigger plan by O&R to upgrade their electrical system) and an initial press release announcing the need for the New City substation including claims about the growth in electrical usage that have not been substantiated in the DEIS.

I hope this information, along with my prior presentations, documents and emails, are helpful to building a better understanding of the problems with O&R's proposed substation and will ultimately lead to "better thinking" by O&R to meet our community's future electrical requirements.

Sincerely,

Marvin

Marvin Baum

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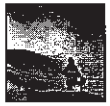
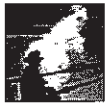
San Bruno fire levels neighborhood - gas explosion

Marisa Lagos, Kevin Fagan, Michael Cabanatuan,Justin Berton, Chronicle Staff Writers
Friday, September 10, 2010





More...

(09-09) 22:03 PDT SAN BRUNO -- With a thunderous roar heard for miles, a natural gas line explosion ripped through a San Bruno neighborhood Thursday evening, sending up a geyser of fire that killed at least one person and injured more than 20 others, and igniting a blaze that destroyed 53 homes and damaged 120 more, authorities said.

The wind-whipped blaze leaped from structure to structure in the neighborhood near Skyline Boulevard and Sneath Lane, west of Interstate 280, raging unabated for almost an hour as emergency crews rushed in and residents streamed out.

The central ball of fire, fed by the Pacific Gas and Electric Co. gas line, raged past nightfall before abating. By then, houses on several blocks and thick stands of trees were engulfed in flames.

Power was cut off to the area, and the only light came from emergency vehicles and the smoldering houses. Firefighting planes roared overhead, dumping retardant onto the blazes, and the scene took on a chaotic tone as neighbors desperately searched for help and for each other.

San Bruno officials said the explosion happened near or in Glenview Park, just east of Skyline and north of San Bruno Avenue. A huge crater was left in the street at the heart of the explosion.

ity," Mayor Jim Ruane said.

he said. "This is going to be a long haul for this city."

han 100 people were in evacuation centers. Firefighters had not been able to get into the area to search for people, he said.

id late Thursday night. "We are still not able to access the area fully."

rn flank, he said.

ere in their home on Vermont Way, a couple of blocks north, when the house shook violently about 6:15 p.m.

Injured in hospitals

Deputy San Mateo County Coroner April Florent said "there are deaths, but we do not have a number right now." She said it would take awhile to compile a count because investigators must go from house to house.

Fifteen people were being treated at Kaiser Medical Center in South San Francisco for burns, smoke inhalation and other injuries, spokeswoman Stacey Wagner said. Some critically burned patients had been transferred earlier to St. Francis Memorial Hospital in San Francisco, she said. Three patients went to Seton Medical Center in Daly City.

Five injured people were taken to San Francisco General Hospital. Spokeswoman Rachael Kagan said three were in critical condition - a man in his fifties and a woman in her eighties, both suffering from burn injuries, and a woman in her eighties being treated for smoke inhalation.

A woman in her sixties was in serious condition with smoke inhalation, and the fifth victim was in good condition, Kagan said.

PG&E spokesman Jeff Smith said one of the utility's natural gas transmission lines ruptured. The reason for the rupture is unknown, he said.

"If it is ultimately determined that we were responsible for the cause of this incident, we will take accountability," Smith said. "Our thoughts go out to everyone affected by this terrible situation."

Abelardo Vega, 34, of Daly City was at a church service nearby and came to check on a friend in the neighborhood when the blast happened. He couldn't reach the friend but got his cell phone's voice-mail message.

"Thanks for your concern," the message said. "My house did catch on f- fire. Luckily, none of my family got hurt. They're all OK. ... I lost my house."

Flames up to 300 feet high

Joe Simpson, who lives a half-mile from the explosion, said the blast had shaken his house like an earthquake. "I felt it as much as I heard it," he said.

As night fell, Simpson said he had a startling view of the fire geyser from his backyard, estimating the flames were shooting 200 to 300 feet high.

California Emergency Management Agency spokesman Kelly Huston said the official count by about 10 p.m. was 120 homes damaged and 53 structures destroyed. The fire was 50 percent contained, he said, and it consumed a 10-acre area. Mutual aid came from many agencies throughout the Bay Area.

'It was so loud'

"Apparently the explosion was so catastrophic it knocked out power and water lines, which complicated the firefighting effort," he said. "Some units are having to shuttle water into the area."

David Pinochi, who lives on Crestmoor Drive a quarter-mile away from the explosion, was evacuated as large bits of ash rained down. Firefighters marked houses with a large "X" after they evacuated families.

"I've loaded up my dogs, and I'm getting ready to go," said Pinochi, who ran to get home to check on his children, ages 10, 12 and 16. All were safe. "I took my Niner autographed stuff and packed it up. I'm hoping for the best."

Ed Hornung, who also was evacuating, said, "It was so loud, it could have been a nuclear explosion."

Emergency shelter set up

A shelter for residents was established at a San Bruno Parks and Recreation Department center.

Sheriff's deputies and police began evacuating residents near the fireball within minutes, pounding on doors as the flames raged nearby. They went door to door, ordering people out of their houses as their colleagues set up equipment mere feet away to battle the flames.

Naber and his mother, in their house on Vermont Avenue, rushed for the front door after they heard the explosion and tried to open it, but the door handle was too hot. He ran to his room, grabbed his car keys and fled the house with his mother through another exit.

Running out of the heat

As they ran to the car, which was parked on the street, they could see a fireball. The heat was so intense, it burned the hair off his arms, he said as he stood in shock with his mother on Skyline.

"It's really sad for all those residents, for all the people who were on top of the explosion," Naber said.

Leigh Bishop, staff pastor at Church of the Highlands in San Bruno, was standing in the parking lot preparing for a night meeting when the blast ripped into the sky.

"It was absolutely frightening," Bishop said. "A huge yellowing billow of flame. I thought it was right behind our church building and ran in to pull the fire alarm and get everyone out of the church."

He realized it was about three-fourths of a mile away.

"The initial explosion was just deafening," Bishop said.

City Manager Connie Jackson asked all residents of the area to call a hot line at **(650) 616-7180** . Authorities are trying to account for all residents.

Chronicle staff writers Henry K. Lee, Demian Bulwa and Carolyn Jones contributed to this report.

E-mail the writers at mlagos@sfchronicle.com, kfagan@sfchronicle.com, mcabanatuan@sfchronicle.com, and jberton@sfchronicle.com.

http://sfgate.com/cgi-bin/article.cgi?f=/c/a/2010/09/10/MNDP1FBJRS.DTL

*This article appeared on page **A - 1** of the San Francisco Chronicle*

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Editor Robin Traum robin.traum@patch.com

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Police & Fire

Contractor Cited For Error Pleads Guilty In West Haverstraw Gas Blast

Explosion destroyed one home, damaged others.

By William Demarest Email the author May 18, 2012

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A Westchester contractor cited for a construction error that led to a natural gas explosion that destroyed one West Haverstraw home and damaged others pleaded guilty today to reckless endangerment.

Rockland County District Attorney Thomas Zugibe also said the contracting company itself, FGC Communications, has pleaded guilty to first-degree assault.

"This incident is particularly disturbing because it could have been prevented," Zubige said. "By violating applicable regulations and industry standards, these defendants nearly caused the deaths of four people and left several families homeless. Their careless and short-sighted decisions had the potential to cause serious loss of life."

Fidel Padilla, 53, of 97 Croton Ave., Cortlandt Manor, pleaded guilty to first-degree reckless endangerment, a felony. The company, also of 97 Croton Avenue, Cortlandt Manor, pleaded guilty to assault separately.

Padilla, a general contractor who conducts his business under the corporate name of FGC Communications Inc., was hired by a subcontractor to install a two-inch conduit at the Fairgrounds II condiminum complex in the Village of West Haverstraw, just off Route 9W. The conduit was for the installation of Verizon Fios fiberoptic cable.

Over several days, the conduit was installed throughout much of the complex without incident. On Jan. 16, at about 12:15 p.m., the contractor excavated under Zariello Lane using a pneumatic device called a "mole" or "missile" that is used to clear an underground path without having to rip up the surface.

However, the device struck an Orange and Rockland Utilities gas main. This in turn triggered a gas leak and explosion that destroyed the condo unit at 52 Zariello Lane and seriously damaged several other nearby homes.

West Haverstraw volunteer firefighters who were in the process of evacuating the neighborhood were blown off their feet by the blast – along with two Orange and Rockland workers who were there. O&R said the efforts of the utility's workers to shut off a key gas valve after the explosion prevented other possible explosions.

Two firefighters and the two O&R workers were seriously injured, but soon recovered. No one was home at the time of the blast.

"Today's plea agreement not only holds these defendants accountable for their conduct, but also sends a message to the construction industry: those who knowingly risk the public's safety - to save time or money - will face justice," Zugibe said.

The charges filed after the explosion resulted from an investigation conducted by the Haverstraw Police Department and the Rockland County Special Investigations Unit. Padilla and FGC Communications Inc. were arraigned and pled guilty in Rockland County Court before the Judge Charles Apotheker.

Sentencing is scheduled for July 27.

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Possible criminality eyed in West Haverstraw

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Several vehicles were parked in front of the home at 97 Croton Ave. in Cortlandt, where a company connected with the West Haverstraw gas explosion was listed as doing business. The property owner was cited in the past by the town building department for parking commercial vehicles there. / (Robert W. Marchant/The Journal News.)

Written by
Laura Incalcaterra,
Steve Lieberman,
Akiko Matsuda

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WEST HAVERSTRAW — Investigators are working to determine if criminal wrongdoing was involved when workers from a Westchester contractor struck a gas line Monday and a gas explosion leveled a village home and sent four people to the hospital.

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Workers for FGC Communications of Cortlandt hit the gas pipe after digging without knowing the location of underground lines, said Orange and Rockland Utilities, whose line was hit.

Haverstraw Police Chief Charles Miller said detectives interviewed at least three FGC Communications workers on the day of the blast, but he declined to discuss the status of the investigation or any possible charges.

"It's an ongoing investigation and we can't comment on it," Miller said. "We're looking to see if anything criminal occurred and if so, if we have the right people and if we're going to charge them."

Inside

Hi-Tor Lanes served as an unofficial haven for people uprooted by the blast. **5A**

Haverstraw town police, the Rockland County Sheriff's Department and the Rockland District Attorney's Office are conducting interviews and collecting evidence.

Federal authorities also are reviewing the incident, with the U.S. Occupational Safety and Health Administration inspecting the site Wednesday to determine if worker safety had been put in jeopardy, spokesman Ted Fitzgerald said. The state Public Service Commission, which oversees utilities in New York, also is investigating.

Verizon hired a subcontractor, Florida-based MasTec company, to install Fios in the Haverstraw Fairgrounds II development. Then MasTec hired its own subcontractor, FGC Communications, to carry out the work.

FGC Communications workers hit the pipe after noon Monday and called 911 to report the incident.

Two West Haverstraw volunteer firefighters, Ken Patterson and Jerry Knapp, and two O&R workers, Libor Stipek and Ian Mackey, were approaching the front door of 52 Zarriello Lane at 12:37 p.m. when the explosion occurred. The force sent them 40 feet backward.

Mackey was released Tuesday from Good Samaritan Hospital. Patterson remained in Westchester Medical Center with burns and broken bones Wednesday. Stipek and Knapp were released Monday night.

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BMJ. 2005 Jun 4;330(7503):1290.

Childhood cancer in relation to distance from high voltage power lines in England and Wales: a case-control study.

Draper G, Vincent T, Kroll ME, Swanson J.

Childhood Cancer Research Group, University of Oxford, Oxford OX2 6HJ. gerald.draper@ccrg.ox.ac.uk

Abstract

OBJECTIVE: To determine whether there is an association between distance of home address at birth from high voltage power lines and the incidence of leukaemia and other cancers in children in England and Wales.

DESIGN: Case-control study.

SETTING: Cancer registry and National Grid records.

SUBJECTS: Records of 29 081 children with cancer, including 9700 with leukaemia. Children were aged 0-14 years and born in England and Wales, 1962-95. Controls were individually matched for sex, approximate date of birth, and birth registration district. No active participation was required.

MAIN OUTCOME MEASURES: Distance from home address at birth to the nearest high voltage overhead power line in existence at the time.

RESULTS: Compared with those who lived > 600 m from a line at birth, children who lived within 200 m had a relative risk of leukaemia of 1.69 (95% confidence interval 1.13 to 2.53); those born between 200 and 600 m had a relative risk of 1.23 (1.02 to 1.49). There was a significant ($P < 0.01$) trend in risk in relation to the reciprocal of distance from the line. No excess risk in relation to proximity to lines was found for other childhood cancers.

CONCLUSIONS: There is an association between childhood leukaemia and proximity of home address at birth to high voltage power lines, and the apparent risk extends to a greater distance than would have been expected from previous studies. About 4% of children in England and Wales live within 600 m of high voltage lines at birth. If the association is causal, about 1% of childhood leukaemia in England and Wales would be attributable to these lines, though this estimate has considerable statistical uncertainty. There is no accepted biological mechanism to explain the epidemiological results; indeed, the relation may be due to chance or confounding.

Comment in

BMJ. 2005 Jun 4;330(7503):1279-80.
BMJ. 2005 Jun 4;330(7503):1293.
BMJ. 2005 Sep 17;331(7517):635; discussion 636; author reply 636-7.
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BMJ. 2005 Sep 17;331(7517):635; discussion 636; author reply 636-7.
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Childhood leukaemia and Downs Syndrome

Children with Down's syndrome have a higher risk of getting childhood leukaemia, about 20 times higher.

A study from Mexico has looked at children with Down's, and found that children with Down's who are exposed to magnetic fields appear to have a high risk of leukaemia than children with Down's who are not exposed. This would appear to be a similar proportionate increase in risk as suggested by the pooled analyses for children in general. This is just one study, however, and needs replicating elsewhere.

Epidemiology. 2007 Jan;18(1):158-61

Magnetic fields and acute leukemia in children with Down syndrome.

Mejia-Arangure JM, Fajardo-Gutierrez A, Perez-Saldivar ML, Gorodezky C, Martinez-Avalos A, Romero-Guzman L, Campo-Martinez MA, Flores-Lujano J, Salamanca-Gomez F, Velasquez-Perez L.

Epidemiologia, Clinica, Hospital de Pediatria, Centro Medico Nacional, Siglo XXI, Instituto Mexicano del Seguro Social, Mexico. juan.mejiaa@imss.gob.mx

BACKGROUND: We analyzed effects of exposure to magnetic fields on the expression of acute leukemia in children with Down syndrome (who have a 20-fold higher risk of leukemia).
METHODS: We performed a case-control study that included 42 children with both acute leukemia and Down syndrome as cases and 124 healthy children with Down syndrome as controls. We obtained demographic information concerning the children and took spot measurements of magnetic fields at each residence.
RESULTS: The odds ratio for direct measurements of magnetic fields >/=6.00 mG was 3.7 (95% confidence interval = 1.05-13.1).
CONCLUSION: The association between magnetic fields and leukemia in children with Down syndrome suggests the possibility of a causal role for magnetic fields in the etiology of leukemia among a genetically susceptible subgroup of children.

REPORT ON BILLS FAVORABLY REPORTED BY COMMITTEE

COMMITTEE: Energy and Technology Committee

File No.: 105

Bill No.: HB-5418

PH Date: 2/26/2004

Action/Date: 3/4/2004

Reference Change: JFS to the Floor

TITLE OF BILL:

AN ACT CONCERNING ELECTRIC TRANSMISSION LINE SITING CRITERIA.

SPONSORS OF BILL:

Energy & Technology Committee

REASONS FOR BILL:

To prohibit the Connecticut Siting Council from siting certain overhead electric transmission lines within a certain amount of feet of a private or public school, licensed day care facility, licensed youth camp or public playground. The substitute language makes the last two sections of this bill equal the first two sections.

RESPONSE FROM ADMINISTRATION/AGENCY:

Attorney General Richard Blumenthal (AG)- The concept of this bill is to recognize that high voltage transmission lines may endanger children and are inappropriate near sites where children play for extended periods of time. The AG urges the committee to ensure that the Connecticut Siting Council reviews and considers all alternatives to current siting plans for these high power transmission lines-including conservation measures and small, local power plants-prior to final approval of any siting permit.

Majority Leader Representative James A. Amann- Rep. Amann believes the legislature must take measures to protect our children from health hazards. Given the conflicting scientific effort regarding health risks from electromagnetic fields, the question remains: How should we proceed when locating high voltage lines in our communities? We must come down on the side of caution.

Senator Joseph J. Crisco, Jr.- Supports this bill because he is concerned about the possible health

risks the plan could have on children who congregate in close proximity to the transmission lines. With the utilities' plan before us, we are confronted with the possibility that electromagnetic fields (EMF) will impact negatively on the health of children. This bill would allow the Siting Council to deny the Phase II transmission line plan submitted by the utilities, if construction of those lines occurs in the vicinity of schools, playgrounds and daycare centers.

Representative Themis Klarides- Supports this bill because it would prohibit a public service company from constructing, or modifying, an existing overhead electrical transmission line if the right of way or easement of the line is within 100 feet of such institutions for a 50-133kV line; 150 feet for a 220-230kV line; 250 feet for 345-495kv line or within 350 feet for a 500-550 kV line. At present there is no definitive link between childhood leukemia and EMF, however there is some evidence of a cause and effect relationship. Until this relationship is clearly understood, we should avoid placing power lines overhead in residential areas.

Representative Mary G. Fritz- Will support the bill with her recommended amendments, as follows:

1. Rep. Fritz requests that any community, which is part of Phase II of the expansion of electric transmission lines, which already has a 345kV, line in an area, that no duplication of 345kV line be allowed in that same area.

2. Rep. Fritz requests that the Connecticut Siting Council shall require of the applicants of Phase II alternate routes for every community which is part of Phase II, with emphasis and full discovery on placing transmission lines underground or under road.

3. Rep. Fritz requests that the Connecticut Siting Council be mandated to give weight to the arguments and testimony provided regarding health concerns and economic concerns in this expansion of the electric transmission lines known as Phase II docket 272.

Senator William A. Aniskovich- Believes there is an alternative to the overhead line proposition-bury the transmission lines in existing rights of way. This bill would restrict where the Siting Council could allow certain overhead lines to be located-for lines carrying between 345 and 495 kilovolts at least 250 feet from any school, day care facility, camp or playground.

Representative Al Adinolfi- Supports this bill and recommends the inclusion of Hospitals, Nursing Homes and Elderly Housing. The National Institute of Environmental Health Sciences have reported that there is an association between exposure to EMF and an increased risk for chronic lymphocytic leukemia and brain cancer. With these potential risks, it only makes sense that we strictly limit the location of these power lines near where our communities' children spend a great deal of their time at school or play.

Elaine Zimmerman, Executive Director for the Commission on Children- This legislation establishes a uniform safety zone for educational learning centers. Without this legislation, Connecticut children may face increased risks from EMF exposure as power companies build new and more powerful aboveground cables. Although the scientific evidence is inconclusive, there is sufficient evidence to be very concerned that EMF's pose a serious health risk to children. The National Institute of Environmental Health Sciences/National Institute of Health concluded in a 1999 report called for "continued emphasis on educating both the public and the regulated community on means aimed at reducing exposures".

NATURE AND SOURCES OF SUPPORT:

Amey W. Marrella, Town of Woodbridge First Selectman- Amey W. Marrella would like for this legislation, as proposed, should go into effect immediately. This bill simply amplifies the need for the Connecticut Siting Council to consider health impacts. Given the potential health effects, it makes sense to

enact a limited and specific siting requiring that safeguards all schools, day care facilities, camps and playgrounds within Connecticut.

Carl Baum, M.D. Yale University Assistant Professor of Pediatrics School of Medicine and Director of the Center for Children's Environmental Toxicology at Yale-New Haven Children's Hospital- As a pediatrician and medical toxicologist, Dr. Baum has reviewed the medical literature on the subject of power lines and the EMF they generate. The medical literature does support an association between electromagnetic fields and childhood leukemia that is unlikely due to chance; the exact cause-and-effect relationship between the two has yet to be determined. The National Institutes of Health have concluded that exposure of children to EMF cannot be considered safe. Dr. Baum believes the legislature has the responsibility to consider all scientific evidence on the effects of electromagnetic fields.

Peter Rabinowitz, M.D., M.P.H. Assistant Professor of Medicine at the Yale University School of Medicine and Director of Clinical Services at the Yale Occupational and Environmental Medicine Program- What the power companies are proposing goes against recommendations of the National Institutes of Health (NIH) and the World Health Organization (WHO). The WHO's International Agency for Research in Cancer has labeled EMF as "possibly carcinogenic". Background EMF exposures for the general population have been estimated in the range of less than 1 milligauss, averaged over a 24-hour period. In studies of children, EMF daily exposures of 3-4 milligauss have been associated with a doubling of leukemia risk. Dr. Rabinowitz urges the legislature to protect the children by not allowing power companies to increase EMF exposures near schools and playgrounds.

Alan Gerber, Professor of Political Science at Yale University- Given the potential danger, going ahead with the current utility company plan is extremely irresponsible and fails to show proper regard for our children's health and safety.

John H. Krystal, M.D., Deputy Chairman for Research Yale University School of Medicine/Department of Psychiatry- Asks the legislature to consider the negative psychological impact of the proposed power lines could adversely affect the brain function of our children.

Jody Ellant, Co-Chairperson Keepthechildrensafe (Woodbridge, CT)- Through her research, in other similarly densely populated states, Power Companies have self-regulated by making the ethical corporate decision not to site high voltage power transmission lines near schools. In fact, the Tennessee Valley Authority states that a desirable distance between transmission lines of a similar voltage to the ones proposed by Connecticut Light and Power and United Illuminating and schools is 1200 feet.

Shelley G. Kreiger, Head of School Ezra Academy- The proposed line is within 30-50 feet of the school. She is very concerned for the health of the students as she once lost a child to cancer herself. She urges the committee to heavily consider the health risks.

Diana McCain (resident of Durham, CT)- Encourages the authors of this bill to change the text of added subsections D, E and F to read, "No private or public school licensed child day care facility, licensed youth camp or public playground or residence within."

Stephanie Green, M.D. Infectious Diseases Specialist/New Haven Health Department- Supports the proposed bill to protect the health and safety of the children in the state of Connecticut. Dr. Green also requests support for the language in the proposed legislation to ensure that the proposed safety buffers are enacted with respect to the Phase II application before the CT Siting Council.

Connecticut Education Association- Supports the legislation that could avoid possible health risks.

South Central Regional Council of Governments (SCRCG)- Michele Goldblatt, Chairman of

SCRCG supports this bill with an amendment in sections (D), (E) and (F).

RuthAnn Wiesenthal-Gold, President of the Woodlands Coalition- Supports this bill but respectfully requests the bill be amended by adding the words "residential neighborhoods".

Lynn Stanwood of Durham, CT- "Residential neighborhoods must be included in the Energy bill simply due to reasonable doubt. All power lines must be under grounded especially in residential neighborhoods."

Karen Leibowitz of Woodbridge, CT- Supports this legislation because the transmission lines cut right across areas where many children go to school and play. This bill employs a precautionary principle and ensures that the children are safe.

Walter Pietruska of Durham, CT- Would like the language of the bill to be changed to include "densely populated areas."

Mayor James L. Richetelli, Jr. of Milford, CT- Supports this bill with the hope that it twill protect those individuals, families and communities that will be impacted as well as ensuring the health and safety of our community's future.

Maryann P. Goord, Town of Durham First Selectwoman- Supports this bill and would like to recommend additional language, such as, "residential neighborhoods". Selectwoman Goord also requests that if the bill is passed into law, have it apply to pending as well as future applications before the Connecticut Siting Council.

Rabbi Richard Eisenberg of Woodbridge, CT- Supports the bill

***For additional testimony, please read the transcript.

NATURE AND SOURCES OF OPPOSITION:

Connecticut Business and Industry Association (CBIA)- Robert Early, CBIA Staff Attorney, opposes the bill because they feel that "the ultimate solution to CT's energy problems requires a comprehensive approach that goes beyond transmission enhancement and siting revisions. In short, state energy policy must recognize the need to support the following priorities:

1. Upgrades to our electric and natural gas transmission systems and the siting of adequate generation capacity.

2. The creation of vibrant competitive marketplaces for both electricity and natural gas.

3. Conservation and Load Management efforts, as well as, the development and deployment of alternative energy technologies.

"Such a multifaceted approach will likely remedy the problems not only in Southwest, CT but the entire state."

United Illuminating Company (UI)- Dennis Hrabchak opposes this bill because they feel the proposed legislation is unnecessary, because the CT Siting Council already has the statutory responsibility and authority to consider the issues of concern in this bill. UI shares the concern for the public health and safety that forms the underlying intent of the bill "However, these concerns are already comprehensively addressed in the existing siting process".

Northeast Utilities (NU)- Robert Carberry on behalf of Connecticut Light & Power feels that this bill

"proposes unnecessary construction limitations which threaten to compromise NU's ability to provide reliable service to Connecticut consumers. Enactment of this bill would impose significant constraints on the siting of electric transmission lines making the process unnecessarily difficult and the cost of these facilities far more costly to Connecticut consumers than is necessary to address the concerns noted by bill sponsors."

Kellie M. Guilbert, Clerk — March 24, 2004

Reported by — Date

MICRO WAVE NEWS

A Report on Non-Ionizing Radiation

Faulty DNA Repair May Explain EMF Role in Childhood Leukemia

December 15, 2008

This could be a breakthrough, a major breakthrough. It could explain how power lines promote childhood leukemia. It could identify which children are at greatest risk. And it could shed new light on the pivotal role played by EMF-induced DNA breaks.

Chinese researchers have found that children who carry a defective version of a gene that would otherwise help repair damaged DNA are much more likely to develop leukemia if they also live near power lines or transformers. Xiaoming Shen and coworkers at the Jiao Tong University School of Medicine in Shanghai have reported that children with this genetic variant —known as a polymorphism or snp (pronounced "snip") —and who lived within 100 meters of these sources of EMFs had over four times more leukemia than neighboring children with a fully functional version of the same gene.

After so many have spent the last 30 years trying to understand how EMFs could promote childhood leukemia, Shen has come up with a relatively simple explanation: Children exposed to power-line EMFs suffer more DNA breaks, but those who carry this modified gene cannot repair the damaged DNA, making them more susceptible to cancer. Childhood leukemia is now generally believed to be initiated by a chromosomal rearrangement that occurs in the womb, followed by some environmental insult after birth. The power-line-induced DNA breaks could be one of many such possible secondary events.

Writing in the December issue of *Leukemia & Lymphoma*, Shen warned that children who carry this snp "could be particularly sensitive to the carcinogenic effects of EMF." He went on to suggest that it may be possible to prevent some leukemias by eliminating these children's exposures to EMFs. You Yang is the first of six authors of the paper.

As early as 1997, Henry Lai and N.P. Singh showed that power-line EMFs lead to higher levels of DNA breaks in rats. Even though their work has been repeated in a number of labs over the last decade —for instance, by Britt-Marie Svedenstål in Sweden, Hugo Rüdiger in Austria and Primo Schär in Switzerland— it remains controversial, partly because some others have failed to see the same effect and partly because some physicists continue to insist that the only way to accumulate DNA breaks is by breaking chemical bonds and EMFs don't have the necessary photon energy to do so (even this latter argument has been challenged).

In that first 1997 paper, Lai and Singh suggested that what they might be seeing is a modulation of DNA repair rather than broken DNA bonds. "A possible explanation of the present observations," they wrote, "is that 60 Hz magnetic fields affect enzymatic processes involved in DNA repair, leading to an accumulation of DNA strand breaks." Their hypothesis was later supported by a group led by Kim O'Neill in Utah. Shen's new finding introduces a genetic component and raises the possibility that there are two independent processes that impair

DNA repair.

This gene in question is called *XRCC1* and is one of many known to help repair DNA damage. The variant studied by Shen has the same sequence as its more common, wild-type version except for the substitution of one single base, an adenine (A) for a guanine (G). This snp is known by a variety of designations: "rs25489," "Ex9+16G>A" and "Arg280His."

Others have previously shown that the same Ex9+16G>A polymorphism makes its carriers more likely to develop breast and prostate cancer. For instance, researchers in Cyprus, France and the U.S. have all reported that women with this snp have higher rates of breast cancer. Women who smoked cigarettes were typically at the greatest risk —here, the chemical carcinogens in cigarette smoke would cause the DNA breaks. Similarly, male smokers in China who carry this same snp have been found to have higher rates of prostate cancer. (For more on polymorphisms and cancer, see reviews from IARC and the Fred Hutchinson Cancer Center; both are free downloads.)

Shen's finding may also explain why children in Mexico City have one of the highest incidences of leukemia in the world. According to statistics compiled by the Centers for Disease Control (CDC), Mexican-Americans are much more likely to carry the Ex9+16G>A snp than non-Hispanic (white and black) Americans: over 20% compared to 6-8%. Juan Manuel Mejía-Aranguré has also reported that children in Mexico City also have higher magnetic field exposures than those in other countries, often more than 0.6 μT (6 mG).

Shen told *Microwave News* that 4-6% of his study population, who live within 500 km of Shanghai carry the Ex9+16G> polymorphism.

One last, but far-reaching, implication of Shen's study is that, if proved correct in further studies, it would implicate extremely weak magnetic fields, certainly less that 0.1 μT (1 mG). Shen found that the leukemia risk among carriers of the Ex9+16G>A snp extended out to at least 100 meters. Even at 500 meters more of these children had leukemia, but here the increase was no longer significant. Though this finding is surprising, it is consistent with a large 2005 study by Gerald Draper in the U.K., who found higher risks among children living 200 meters from high-voltage power lines. Draper also saw a risk out to 600 meters, which only just attained significance. (The British and Chinese used different epidemiological techniques and their risk estimates are not comparable.)

In his response to a barrage of attacks, Draper wrote: "We have been criticized for publishing alarming results that we cannot explain. We should have preferred to delay publication until we could analyze magnetic field exposure data and, if possible, explain our results. It would have been unethical, however, not to publish results of potential health significance." The results of Draper's magnetic field analysis are expected next year.

We await for the reaction to Shen's breakthrough. He has tied together so many loose ends, it simply cannot be ignored.

ELF EMFs, childhood leukemia, China, DNA breaks, XRCC1, Henry Lai, N.P. Singh, Xiaoming Shen, Primo Schår, Gerald Draper,

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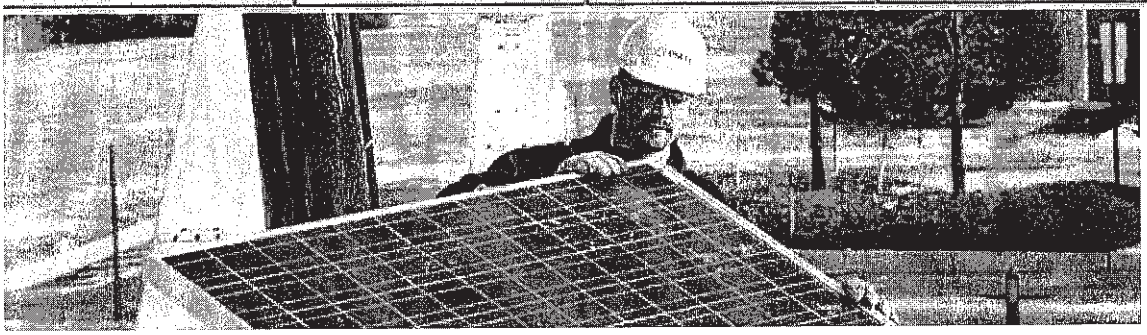

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The PSE&G Solar 4 All™ program will add 80 megawatts (MW) of solar electric generation capacity to the PSE&G electrical system by the end of 2012. That is enough solar energy to power about 13,000 average size New Jersey homes.

Solar 4 All provides numerous benefits to PSE&G customers and the State of New Jersey

- The power generated by Solar 4 All projects is tied directly into the electric grid to be used by all PSE&G electric customers
- Every one of the panels placed in service generates value from the sale of its electricity and capacity into the wholesale electric grid, the solar renewable energy certificates (SRECs) that it generates and the federal investment tax credits PSE&G attracts. PSE&G monetizes this value and the dollars are returned to customers by offsetting the overall cost of the program
- Solar 4 All provides a greatly increased amount of clean, carbon free renewable energy in New Jersey. This renewable energy replaces some amount of traditional fossil fuel electric generation.
- The program is helping to create jobs and drive economic development by making New Jersey a leading state for solar power.

Solar 4 All is divided into two main initiatives – 40 megawatts in "neighborhood" solar and 40 megawatts of "centralized" solar. By dividing the program into these two broad categories, PSE&G can take advantage of some previously untapped resources – space on utility poles, unused remediated brownfields and flat-top roofs.

By installing solar panels on utility poles, building solar farms and leasing space on roof tops PSE&G is able to unlock solar's potential and deliver its benefits to all customers.

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Securing the Nation's Power Grid

Friday, 25 May 2012 00:00
By Craig Lewis and R. James Woolsey, Truthout | Op-Ed

(Photo: Diego Iaconelli / Flickr)

The week of May 7, federal regulators released a report detailing the cause of a September 2011 blackout that left millions of residents in Arizona and California without electricity. This report underscores the vulnerability of our electrical grid and reinforces the need to safeguard our grid from future outages by integrating clean local energy and intelligent grid solutions.

According to the report, the blackout was initially triggered by a transmission line failure in Arizona and then compounded by poor operations planning and a lack of real-time situational awareness. These failures resulted in cascading blackouts across the Southwest - disrupting public services, business activity and transportation systems. By the time the lights came back on, the 15-hour blackout had caused an estimated $100 million in losses.

Large-scale power outages are by no means uncommon in the United States. In fact, last September's blackout was caused by a number of the same issues that triggered a massive 2003 outage which affected more than 50 million Americans in the Northeast and Midwest. Moreover, fears of another blackout loom in Southern California as regulators scramble to find replacement power generation for the troubled San Onofre nuclear plant, which has been offline for more than three months.

When blackouts occur, our nation's economic engine grinds to a halt. A study by the Galvin Electricity Initiative found that blackouts cost Americans an estimated $150 billion in economic losses annually. In addition to disrupting our economy, grid failures also jeopardize public safety by impairing critical services, such as water, sewage treatment, heating and cooling. As a result, blackouts during severe winter weather or extreme heat conditions can cause life-threatening situations.

To avert future costly blackouts, the United States must modernize its energy system. Currently, the nation's power grid is based on a 100-year old approach that centralizes power generation. Under this increasingly outdated approach, electricity is generated at remote, large-scale power stations and then transmitted long distances to population centers where the energy is actually used. As a result, this highly centralized system is vulnerable to massive failures. Any disruption in centralized power generation or transmission lines, whether from severe weather, mechanical malfunction, human error, or terrorist attack, can result in power failures affecting entire regions of the country.

Rather than continuing to invest billions of dollars to expand this brittle system, policymakers should embrace a more reliable, decentralized electrical system. Distributed generation of clean energy integrated with intelligent grid solutions will result in a far more efficient and resilient electrical system. Clean, local energy production mitigates the impact of any single power station or power line failing. Intelligent grid solutions, such as demand response and energy storage, significantly increase grid reliability by enabling local balancing of supply of and demand for energy. Together, distributed generation and intelligent grid solutions allow for the creation of micro-grids that remain as functional "islands" during widespread grid failures and continue to

provide power for essential services. This was demonstrated at the University of California San Diego (UCSD) during the Southwest blackout of September 2011 - UCSD's microgrid allowed the campus to disconnect from the larger grid and continue normal operations.

Critics argue that distributed energy generation is too expensive. However, US communities have demonstrated that Clean Local Energy Accessible Now (CLEAN) programs (sometimes called "feed-in tariffs") make it possible to scale local renewable energy generation quickly and cost-effectively. A CLEAN program is a proven policy tool that unleashes rapid local renewable energy development by reducing risks, transaction costs and complexities involved in selling clean energy from underused spaces in communities, such as rooftops, parking lots and landfills. These programs can be designed to have no impact on electric rates, as demonstrated in Sacramento, California, where clean, local energy costs ratepayers the same as central-station energy.

The time is now for the nation to aggressively expand clean, local energy production and invest in intelligent grid solutions to secure the power grid. As we've seen, the alternative is far too costly.

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EMAIL THIS STORY TO A FRIEND

R. JAMES WOOLSEY

R. James Woolsey is the chairman of the Foundation for Defense of Democracies and the former director of the Central Intelligence Agency (1993-1995).

CRAIG LEWIS

Craig Lewis is the executive director of the Clean Coalition.

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United States Senate

COMMITTEE ON
LABOR AND PUBLIC WELFARE

January 5, 1967

Miss Patricia Podolak
2988 Springhurst Court
Yorktown Heights, New York

Dear Patricia:

Thank you very much for your thoughtful letter concerning Con Ed Power project. May I commend you not only for your excellent composition and beautiful handwriting but also for your initiative in writing to your Senator about this problem.

Congress, too, has been concerned about the dangers and the ugliness of overhead transmission lines. Legislation has been introduced to require power companies to put these lines underground and to provide some form of Federal assistance to companies which do so. In addition the Senate Commerce Committee held hearings on these proposals last year. While no final action was taken, it is hoped that a more thorough study of the problem can be completed this year and Federal action taken.

With best wishes,

Sincerely,

Jacob K. Javits, U.S.S.

JKJ:pcp

Con Edison Annual Meeting Speeches
May 18, 2008, 1 p.m.

I. Kevin Burke: Introductory Remarks/Overview

Good morning. It's a pleasure to welcome you to our Annual Meeting.

This morning, Lou Rana, John McMahon, Robert Hoglund, and I will discuss the company's performance in 2007, and our plans for 2008 and beyond.

At the conclusion of our remarks, we'll answer questions.

(Note: Various speeches related to general shareholder meeting issues and Con Edison of New York subsidiary details deleted.)

And now I will turn the podium over to John McMahon, president of Orange and Rockland Utilities.

III. John McMahon

Thank you, Lou. Good morning everyone.

Last year, Orange and Rockland Utilities delivered the most reliable electric service in its 108 year history. The area we serve is vibrant and growing. In fact, Orange County had the highest rate of population growth in the state last year.

As the area grows, so does our customers' demand for energy – and the need to use energy more efficiently.

Orange and Rockland is working on both fronts. This past summer, we met with more than 800 employees to gather ideas to reduce energy consumption within the company. We are acting on those ideas and, more importantly, applying the excitement that this brainstorming effort generated to benefit our customers. We are asking our customers to join the "Change a Light, Change the World" campaign by pledging to replace at least one light bulb with a more energy efficient compact

fluorescent bulb. We are delighted with the large numbers of customers who have stepped up to pledge. These pledges have reduced energy use and greenhouse gas emissions.

We continue to take measures to strengthen our infrastructure with expansions and improvements.

Upgrades to a major transmission line doubled the capacity of Rockland County's Tallman substation. We installed a new transformer in the Shoemaker substation in Middletown. And, in New Jersey's Bergen County, we completely rebuilt the Cresskill facility, tripling its capacity. Substations are a critical part of our plan to meet growing demand, so by 2017 we will build 21 new substations.

Turning to our gas system, we invested $29 million to reinforce and expand our natural gas infrastructure. A new gas distribution control center in Spring Valley opened, and our gas pipeline replacement program surpassed a goal of 85,000 feet.

To attract developers to areas of Orange County targeted for commercial growth, we extended two new gas mains. The Orange County Office of Economic Development praised the project, saying it took the concept of "if you build it -- they will come" -- to a new level. This program is increasing the area's appeal to developers, and giving our gas business a competitive advantage in these emerging markets.

For the seventh year, the National Arbor Foundation recognized O&R as a Tree Line USA Utility. The award acknowledges our environmental leadership in caring for trees while improving the delivery of safe, reliable electric service to our customers. We are proud of this recognition. It shows the kind of results our employees achieve, day-in, day-out, through their hard work, abundant talent, and dedication.

Thank you. Now I will turn the podium over to Robert Hoglund, our chief financial officer.

News Release

news release index

O&R Media Relations • Michael W. Donovan • 845-577-2430

O&R Proposes New Electric Substation for New City

PEARL RIVER, NY December 8, 2008 — Orange and Rockland Utilities is planning to invest $9 million to build a new 120MVA electric substation off Little Tor Road in New City that will improve the electric service reliability in the northern New City community.

It's primarily Clarkstown's growth that makes the substation necessary.

The northern New City area's electric service is presently provided by three O&R substations — one in New Hempstead, one in West Haverstraw and one in Congers. Due to ever-increasing electric demand, these substations are already strained to capacity. Between 2009 and 2014, O&R predicts electric usage to continue to grow at 2.13 percent in Rockland County and in the Little Tor area, O&R predicts that growth to be 3.12 percent.

The current situation places O&R and its Clarkstown customers in the vulnerable position of having minimal electric system backup should equipment fail or be damaged by harsh weather, accident or other event. Electric service reliability is something everyone depends on and it results from having an adequate infrastructure in place. This plan aims to provide just that infrastructure.

The substation is designed to occupy less than one acre. The facility is to be centered on a 10.2 acre parcel owned by O&R, which has maintained high voltage electric equipment, including the Gibbons substation for 57 years, on this property since 1926.

O&R had owned 1.27 acres at this site for 80 years. O&R transmission lines bisect that property and a natural gas regulator station has also been located there for many years.

O&R purchased the contiguous 8.93 acres in 2006 to build the substation. The purchased property was the trash-strewn home of a defunct bungalow colony and tainted wells. O&R arranged for the bungalows to be razed, the wells capped and the site cleaned up.

This facility is an entry point to bring more electricity into the area. This is not a power plant. The proposed substation does not generate electricity. The substation takes high voltage electricity from the 138kv overhead transmission wire that has run through this area for decades and converts that electricity to lower voltage. The substation equipment then channels that lower voltage electricity into the electric distribution system that runs up and down the street to deliver the electricity to homes and businesses.

The fence line of the proposed facility is nearly 250 feet from South Mountain Road and 230 feet from Little Tor Road. The two, H-shaped transmission structures inside the facility will be 68 feet high. A lightning arrestor that resembles a flagpole will be 84 feet 5 inches tall. The substation will be built in

compliance with the National Electric Safety Code.

O&R has retained the services of a landscape architect to develop a vegetation installation and maintenance plan to screen the property and its equipment from the public.

The substation will contain two 50 MVA transformers and one 20 MVA transformer (this transformer is dedicated to providing electricity to Tilcon).

After it's completed, O&R's proposed substation will generate virtually no traffic. O&R plans to install high-tech, low-sound equipment in the substation. This equipment typically registers sound at the fence line on a par with an air conditioner.

The current driveway will be moved from South Mountain Road to Little Tor Road. Containment structures within the substation will limit rain runoff.

The substation will be lit only internally and with limited illumination only for emergency repair or maintenance work. Otherwise, the site will remain dark at night. The property will be gated and fenced and high tech systems will be installed to provide security to the structure. Regular maintenance visits by O&R personnel take place during daylight hours once a month.

O&R plans to call for this substation to be operational and on-line by summer 2010.

To build the substation, O&R requires Clarkstown Planning Board approval. That approval includes a review by the Fire Department, the Town Highway Department, the Town Engineer and the other relevant town of Clarkstown departments.

O&R also requires a Special Use Permit from the Clarkstown Zoning Board of Appeals.

Rockland County Highway Department and the Rockland County Drainage agency must also approve the plan.

Clarkstown residents will benefit from the taxes on the proposed facility. O&R currently pays $20,605 on the property. With the construction of the substation, that annual tax bill rises to $230,225. Of that total, $149,748 is school taxes and $80,477 is Rockland County and Clarkstown Town taxes.

As part of this project, the natural gas regulator station now on the property about 50 feet south of South Mountain Road will be upgraded with state-of the-art equipment and moved another 100 feet further away from South Mountain Road, deeper into the property. The cost of that project is $375,000.

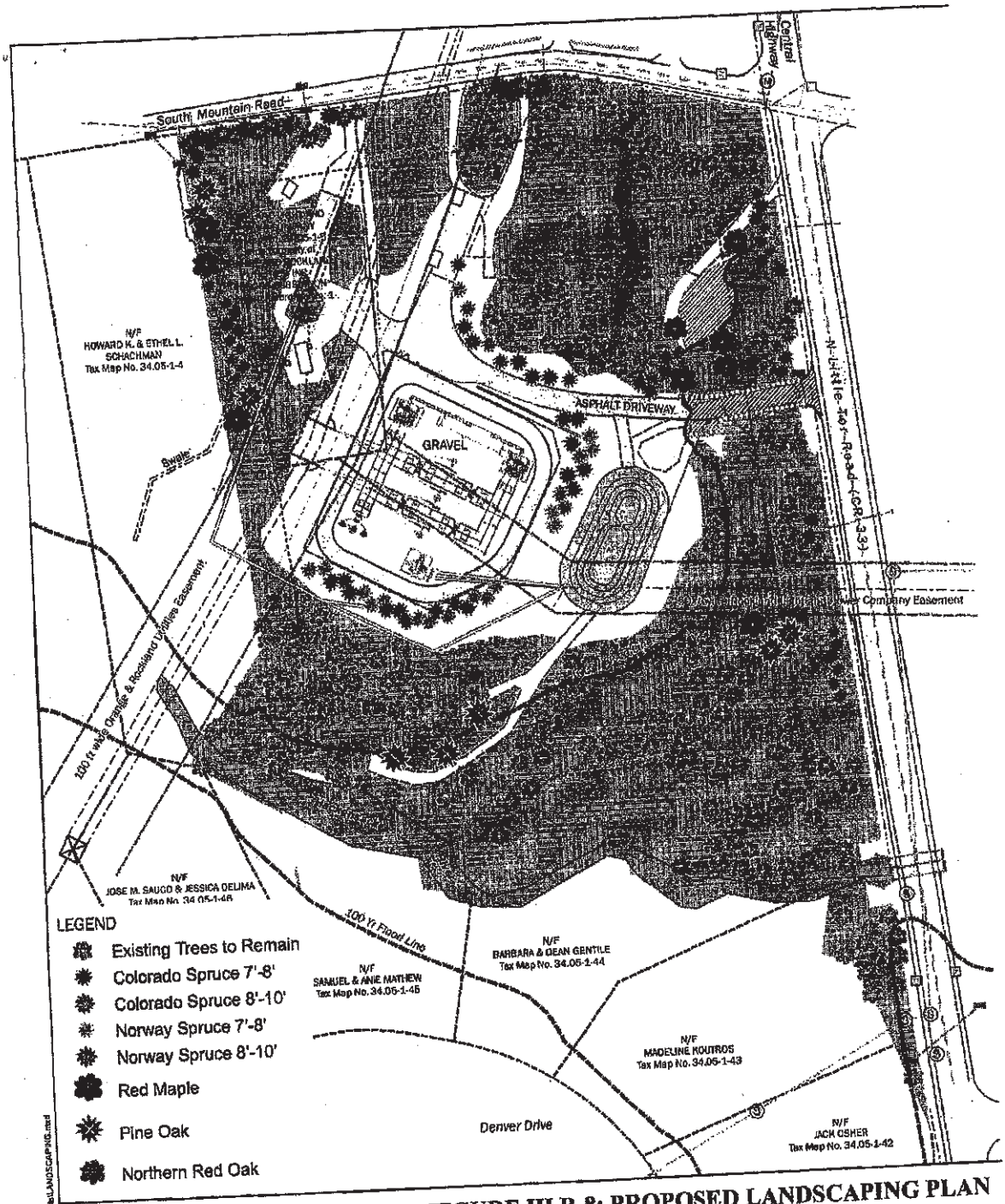


FIGURE III.B-8: PROPOSED LANDSCAPING PLAN

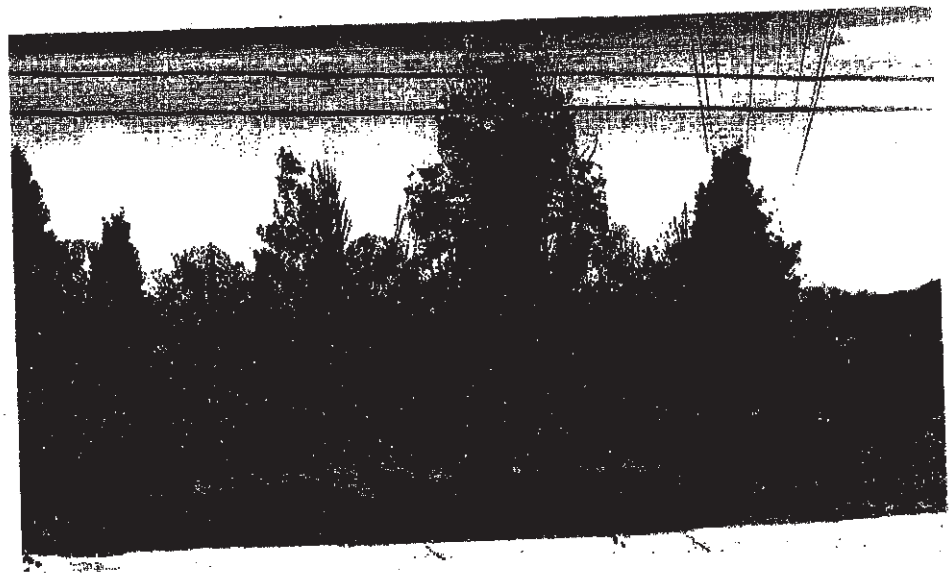
Little Tor Substation

Orange and Rockland Utilities, Inc.

Town of Clarkstown, Rockland County, New York

CMX 131.1 Mamaroneck Avenue Suite 50 White Plains New York

Basemap Source: C.T. Male Associates, P.C.



VIEW 2 SUMMER – SOUTH MOUNTAIN ROAD

VIEW 2 WINTER – SOUTH MOUNTAIN ROAD

FIGURE III.B-4: VIEW 2 "SOUTH MOUNTAIN ROAD"

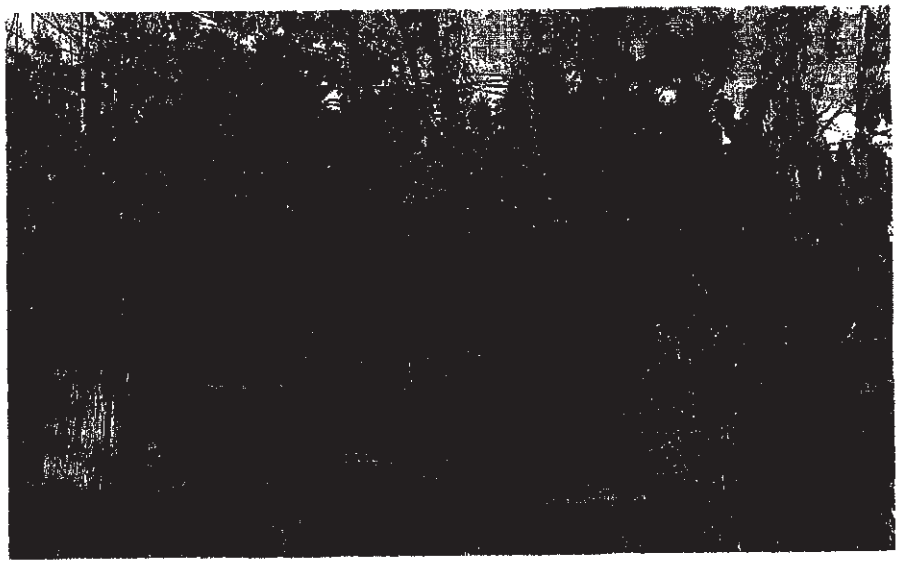
Little Tor Substation

Orange and Rockland Utilities, Inc.

Town of Clarkstown, Rockland County, New York

CMX 1311 Mamaroneck Avenue Suite 50 White Plains New York

Image Source: Degenshein Architects



VIEW 4 SUMMER – FROM SOUTH

VIEW 4 WINTER – FROM SOUTH

FIGURE III.B-6: VIEW 4 "FROM SOUTH"

Little Tor Substation

Orange and Rockland Utilities, Inc.

Town of Clarkstown, Rockland County, New York

Image Source: Degenshein Architects

CMX 1311 Mamaroneck Avenue Suite 50 White Plains New York

Table III. G-5
Summary of Analysis – Design Point 3 (DP-3)

Design Storm	Pre development Peak Discharge Rate (cfs)	Post development Peak Discharge Rate (cfs)
1	0.67	0.67
10	2.05	2.05
25	2.70	2.71
100	3.70	3.70

b. Design

The Stormwater Pollution Prevention Plan (SWPPP) provides an on-site detention basin (F-1) to handle runoff from the access driveway, substation pad area, and contributing area as follows:

A NYSDEC Surface Sand Filter (Type F-1), is used for drainage areas of up to 10 acres. This practice is used to treat stormwater runoff through filtration, using a sediment forebay (pretreatment chamber), a primary filter media (sand) and an underdrain collection system (4" PVC). The forebay, which controls and detains heavy sediment, will be maintained regularly by ORU. ORU shall also comply with the Rockland County Health Department mosquito control regulations, in accordance with the SWPPP. The sediment basin design would also include an additional storage and attenuation bay (where the filtering media is located), which will provide additional detention volume required to control runoff from more severe storms including the 100-year storm event.

Dry Swale (Type O-1), designed to provide the required water quality treatment for the lower sections of the access driveway. These small detention areas are only designed to provide water quality measures.

Rain Garden, designed to provide the required water quality treatment for the entrance of the Access Road. These small detention areas are only designed to provide water quality measures. (***Figure III.G-2, Post-Development Drainage Map***)

Refer to the SWPPP included in Volume II - Appendix F for more details.

c. Pollutant Loading

The Proposed Project, including the stormwater management system, would improve the water quality of the runoff through the application of stormwater management practices (i.e., surface sand filter and water quality practices). Pollutant loading rates for the post-development condition with mitigation would be less than the pollutant loading rates from the post-development condition without the proposed mitigation. In addition, the post development pollutant loading would not be significantly higher than the pre-development pollutant loading.

Pollutant loading is controlled by a series of best management practices that detain the runoff generated from the 90 percent rainfall event for longer than 24 hours.

d. Ground Water Resources

Ground water on the Site is estimated to flow in the southeasterly direction in the form of base flow, from the ridge line of the Site down towards the Hackensack River (West Branch). Although some of the proposed construction activities (access driveway and stormwater management basin) might intercept some ground water, provisions for the design of these components has been taken into consideration. The driveway will utilize curbside underdrains where appropriate to manage groundwater flows. All underdrains would discharge by gravity toward the stormwater piping network or nearest catch basin. The retaining wall would also have an underdrain system behind its base to intercept any ground water or water that collects behind the wall, directing it to the drainage system.

e. Pesticides & Herbicides

Pesticides:

Pesticides are not applied universally to substations during construction or under permanent operation. There may be traps placed in control houses when signs of mouse infestation are evident. During warm weather months, substation personnel will have wasp/hornet spray to use when nests are encountered.

Herbicides:

Based on discussions with ORU's Manager of Vegetation Management, under permanent operating conditions typically electric substations and gas regulators are sprayed once a year with a pre-emergent herbicide mix. This mix consists of Karmex, Roundup Pro and Oust with High-Light as a marker. Herbicides are not required during construction of the substation.

f. Oil Containment

The proximity of the subject site to the Hackensack River requires a heightened sensitivity to the potential of pollutants adversely impacting these environmentally sensitive areas. The stormwater management system has been designed to provide water quality control for the typical pollutants for a site such as this with asphalt paving and other general land disturbance. However, because the three (3) transformers that would be installed on this site are filled with oil, additional measures are necessary.

WHAT ELSE IS IN IT?

The three (3) transformers will be filled with mineral oil which is used as a liquid insulator (resistant to electric charges) and coolant. Each transformer is operated as a

PCBs?

sealed unit and contains oil within an internal reservoir. The transformers do not require ventilation under normal operating conditions, therefore; no vapors are released to the environment. Each transformer is equipped with a pressure relief device, which would open momentarily if the internal pressure (upon reaching higher than normal operating temperature) exceeds 5 psi.

The transformers are designed to operate at a pressure of up to 8 psi. The transformer oil tank is designed to have a 20% safety margin, so that it could operate at 10 psi. If the pressure increases beyond 12 psi, the transformer walls would begin to deform and the seams would rupture. If this were to happen, the transformer oil would be released from the tank and captured by the secondary oil containment basin. Pressures of well over 1,000psi would be required to fragment the tank walls and create projectiles. Since the pressure required to rupture the tank (12 psi) is significantly lower than the 1000psi pressure required to fragment the tank, there is no likelihood that a transformer failure could cause a safety threat from metal projectiles.

4. Proposed Mitigation

   a. Stormwater management System

      The Proposed Project, as designed, would reduce peak discharge rates as noted on ***Table III. G- 3, Summary of Analysis – Design Point 1 (DP -1), Table III. G-4, Summary of Analysis – Design Point 2 (DP -2) and Table III.G-5, Summary of Analysis – Design Point 3 (DP-3).*** The Proposed Project would also meet or exceed the required water quality volumes and would comply with the NYSDEC Phase II stormwater management regulations, NYS erosion and sediment control requirements, and all other applicable regulations.

   b. Herbicides and Pesticides

      To prevent runoff contamination during the application of herbicides, spraying is suspended during rain events and is not applied to standing snow. Once applied, the product (as described above) binds with the soil and does not transport under runoff conditions.

   c. Oil Containment

      There are three levels of mitigation against oil discharging from the site and adversely impacting the groundwater or the adjunct water course. The first level of mitigation is the internal reservoir contained within the transformer. In order for there to be a lowering of oil level, this reservoir must fail. If this were to occur, an alarm would be sent to the central monitoring station notifying Orange and Rockland personnel of the condition.

      The second level of mitigation is an oil containment basin. Each transformer would be situated in its own containment basin which is designed to hold 110% of the

transformer's oil volume plus the runoff volume produced by the 25-year storm event. If the transformer reservoir ruptures, the oil would discharge into this containment basin. A containment basin is essentially a "bathtub". It would consist of a concrete wall surrounding each transformer and a specially designed geocomposite material lining the floor of the containment basin. The basin is filled with ¾" to 1" stone from the bottom of the basin up to the substation grade. The concrete wall is a below grade, 8-inch thick reinforced concrete wall. The concrete wall is further extended 16 inches above grade with the addition of two courses of concrete block. The geocomposite material lining the bottom of the basin is permeable in its natural state; allowing water, from rain or snow melt, to drain from the basin. The geocomposite material contains a copolymer layer which reacts with the transformer oil (or any hydrocarbon) and solidifies. When this layer solidifies, it becomes impermeable thus sealing the bottom of the containment basin and completing the "bathtub". If the transformer oil reservoir ruptures, the oil would discharge into this containment basin which would isolate the oil and allow for it to be collected and properly disposed.

To further protect against the release of transformer oil from the substation, a third level of mitigation is proposed at the fence line of the substation. This tertiary oil containment system would consist of an "oil boom". The oil boom is a 12-inch tall nonwoven geotextile with an engineered polymer material bound in the center. The engineered polymer material allows water to pass through under normal conditions but solidifies when in contact with transformer oil (or any hydrocarbon) and becomes impermeable. The oil boom would be installed along the substation fence line with approximately 6 inches buried below grade and 6 inches of the boom above grade. In the unlikely event that the oil overcomes the secondary containment system, the transformer oil will be contained within substation by the oil boom.

Volunteers perform as part of a "Life Support Team" alongside Clarkstown's contracted and paid Paramedic staff.

The NCVAC operates a volunteer ambulance service from its headquarters at 200 Congers Road, approximately 3.9 miles from the Project Site. The Corp has a current roster of 75 active riding members; the availability of 4 State Certified ambulances; a Supervisor's Emergency response car; and the special "MASH" disaster unit. All members hold EMT (Emergency Medical Technician) credentials or are in the process of achieving the same. An EVOC (Emergency Vehicle Operating Course) curriculum is offered, which qualifies their drivers as proficient ambulance operators. "Continuing Medical Education Courses" are also available."[1]

(4) Recreation

Pubic Parks

The Town of Clarkstown has three major public parks, including South Mountain County Park, High Tor State Park, and Kennedy Dells County Park. South Mountain Park is approximately 239 acres and is located off of S. Mountain Road, with portions of the park existing within the Town of Ramapo, Haverstraw, and Clarkstown. The park includes hiking via the Long Path Trail. The Long Path Trail runs the length of the park and provides study of nature, geology, and scenic views. "High Tor State Park, a day-use facility for picnicking, swimming and hiking, affords spectacular views of the Hudson River. The Long Path passes through the Park just before the trail heads inland to the Catskills"[2]. Kennedy Dells Park "is a hemlock gorge along with fields and a dump/waste area. There are a number of soccer and baseball fields here also"[3].

b. Impacts and Mitigations

Emergency Services

The Proposed Project is within close proximity of Police, Fire, and Ambulance facilities which have adequate staff and equipment to service this un-manned facility. From a police perspective, the proposed mitigation includes a fence around the entire facility with security cameras that are monitored by Orange and Rockland Utility.

EVENT? WEDDING? BAR MITZVAH?

Although the potential for an event is possible, the fact that this facility will be constructed with state of the art equipment significantly reduces the likelihood of such an event. The access to the site has been designed to accommodate the heavy equipment required to maintain this facility when such maintenance is required. It is also designed to accommodate emergency vehicles including adequate room for an emergency vehicles to turn around.

TREES SURROUNDING SUBSTATION?

[1] http://www.newcityems.org/history.htm
[2] http://nysparks.state.ny.us/parks/info.asp?parkID=58
[3] http://nynjctbotany.org/whudson/nykenndy.html

Orange and Rockland Utilities periodically trains fire companies within its service territory regarding responses to calls at ORU facilities. This training is always available upon request as well. Once the substation is ready for operation, Orange and Rockland Utilities will meet with the local fire company and provide a training session that gives the fire company a complete understanding of how they should deal with an event. For example, emergency personnel should not enter the facility until it has been de-energized and cleared by Orange and Rockland safety personnel. Also part of the training session is a discussion of how a fire at this type facility should be handled. Typically the best approach to a fire at this type of site would be to contain the fire from spreading, i.e. protecting adjacent properties but letting any fire inside the compound burn itself out. Although a fire in this type of facility can be handled with conventional methods including water, the possibility that an oil filled transformer would ignite and leak oil is further complicated by applying water. Refer to section III-G for an explanation of the oil containment system proposed for this site.

HOW?

GAS + FIRE: A GREAT MIX! WHAT HAPPENS DURING AN EVENT

In addition to the construction of a substation, this project would include the replacement of the existing gas regulator located on the site. The existing regulator which was originally installed in 1962 will be replaced with state of the art equipment, which will be protected by an 8 ft. panel that has sound attenuation properties. The panels will also serve to protect the above ground piping.

The following steps are being taken to minimize the chances of an event at the proposed natural gas regulator station:

- The nearest above-ground piping will be located approximately 100-feet from South Mountain Road, from which there will be no entrance (entry to the substation and regulator station will be from Little Tor Road only). Thus, the risk of vehicular hazards is minimized.
- The majority of the pipe will be buried, minimizing the exposure to above-ground hazards.
- The buried steel pipe will have cathodic protection, thus avoiding external corrosion.
- The only electrical devices that will be located adjacent to the piping are 24-volt DC instruments. These will be installed in accordance with National Electric Code and American Gas Association guidelines for hazardous area installations.
- The station will incorporate telemetry, transmitting real time data to our Gas Control Center, 24 hours a day, 7 days a week.
- All piping will operate at or below 10% of the specified minimum yield strength of the pipe. This equates to at least a 10:1 safety factor.
- Company personnel inspect the station once a month.

service. The supply area for the Little Tor Substation consists of 85% residential customers and 15% commercial/municipal accounts. (Figure II-5, Service Areas Including Little Tor Substation)

+ 20% TILCON DEDICATED

Since the Little Tor Substation is required to maintain service to the surrounding community, ORU is taking this opportunity to reduce outage exposure to the Tilcon facility which is currently supplied out of the West Haverstraw Substation. A third, smaller transformer at Little Tor will be dedicated to Tilcon. This will free the lines between Little Tor and West Haverstraw to serve as distribution backup to the benefit of customers supplied from both those substations. If the Little Tor Substation is not constructed, the existing arrangement is suitable for Tilcon's needs; however, the residential and small commercial/municipal customers will experience a degradation of voltage and decreased continuity of reliable service.

INCREASE TILCON PRODUCTION ? SEGMENT

Key factors to locating a new substation are access to the existing transmission lines and the efficient layout of distribution lines. A system planning analysis further limits the location of the proposed substation as indicated in Figure V-2 (Vicinity Map with Study Area) to satisfy demand and reliability requirements. The viability of alternate sites is determined by criteria such as property size, zoning regulations and the existing use and condition of the property.

Property Criteria:

- Property Size: Although a Utility Use is permitted in the R40, R80 and R160 Districts, such use is governed by the Special Permit criteria including a minimum lot size within the R40 District of 100,000 square feet (approximately 2.3 acres), R80 District of 140,0000 sf (approximately 3.2 acres), and R160 District of 280,000 sf (approximately 6.4 acres).
- Property Configuration: The shape/geometry of the property determines whether the substation can be accommodated and can comply with required building/structure setbacks.
- Proximity to existing ORU Transmission Line Right of Way
- Efficient layout of Distribution Lines: ORU Engineering has determined that the 13.2kV lines must run east, west and south of the intersection of South Mountain Road and Little Tor Road.
- Hackensack River: Several properties are bisected by the west branch of the Hackensack River or one of its tributaries.
- Proximity to Parkland
- No residential structures, uses, or occupation of property

Table V-1 provides a summary of the available parcels in the required service area and their potential as a viable Alternative Site for the required substation

Explosions, blaze at Con Ed substation

BY JORGE FITZ-GIBBON, CANDICE FERRETTE AND KEN VALENTI •
JFITZGIB@LOHUD.COM • JUNE 12, 2010

YONKERS — A malfunctioning oil pump is being blamed for two explosions at a Con Edison substation near I-87 this morning that sent 13 city fire companies into action to douse the smokey blaze.

Police and fire officials said residents in the surrounding Dunwoodie neighborhood were nearly evacuated after firefighters were called to the scene at 9:56 a.m. for fear that the four-story-high plume of smoke at the facility contained PCBs or other toxins.

However, neighbors were simply asked to keep windows closed, as the blaze was brought under control in just over an hour — despite some challenges for the approximately 65 firefighters on the scene.

"There were a lot of factors and hazards to worry about before we actually went and put the fire out," Yonkers Assistant Fire Chief Edward Cucolo said today. "Primarily you've got approximately 350,000 volts overhead. We have to assume they're live. We don't want to get anywhere near that. The equipment inside is very dangerous. You don't want to be in close proximity to any of that equipment, so gaining access to the fire was a concern."

"We had to wait for Con Ed supevisors to direct us as to how to approach this fire," Cucolo said. "Once we were able to do that we put the fire out relatively quickly."

Cucolo said at least 24 of the 65 firefighters who responded to the fire had to undergo decontamination because "they were oil-soaked from head to toe." There were no injuries reported.

The fire sent plumes of thick, black smoke into the air and flames three to four stories high is visible miles away from the site. Jose Caraballo, president of the Yonkers firefighter's union, said he had initial concerns about chemicals being released into the air.

"It could very well have PCBs in it," Carabello said.

Polychlorinated biphenyls, or PCBs, cause irritation to the eyes, ears, nose and throat. They have also been linked to some cancers.

Mineral oil used to cool the transformer caught fire but it is too early to tell what caused it, said Chris Olert, spokesman for the utility. Olert said Con Edison would test the oil for PCBs. Decontaminating first responders at the scene is standard operating procedure, Olert said. He

said no customers lost power due to the fire at the substation, which provides electricity to the Bronx and other parts of New York city and the region.

Evelyn Ortiz, 44, of Yonkers walked down from her Smart Ave. home to see the activity after her daughter ran home to tell her. She said there was an explosion at the substation last year but the smoke from this fire was "much worse." She too was concerned about the air quality.

"Of course, I don't know what's in the air," she said.

lohud.com

November 17, 2009

Con Ed fire spurs oil cleanup along Bronx River

Ernie Garcia
elgarcia@lohud.com

YONKERS — An explosion at a Consolidated Edison substation has set off a massive oil-spill cleanup along the Bronx River.

Scores of workers are cleaning up an unknown quantity of a light, clear oil similar to mineral oil that flowed into the city's storm sewer system on Nov. 4 when a 345-kilovolt transformer containing 30,000 gallons of the fluid caught fire. A machine malfunction created an electrical arc that ignited the oil at 152 Kingston Ave. in the Dunwoodie neighborhood.

The resulting smoky fire was controlled in 20 minutes, and no one lost power from the event. Much of the oil, which was used as a dielectric fluid to cool the transformers, burned or remained on-site, but some of it mixed with the water used to quell the flames and escaped into the city's sewer system, where it flowed into the Bronx River near the Cross County Parkway.

A Con Edison spokesman said that cleanup of the escaped oil began the day of the fire. According to the state Department of Environmental Conservation, the fluid initially eluded capture by booms, a type of sponge that absorbs oil, because of fast-moving water along the river.

Crews hired by Con Edison are now working in areas where the river's flow is slower, mainly near the Bronx Zoo and the New York Botanical Garden.

On Sunday, dozens of workers could be seen at the zoo and garden, placing booms and doing other remediation work. The sewer pipe that delivered the oil to the river is also being cleaned.

Much of the oil has mixed with fallen leaves, and crews are using large vacuum trucks to extract the oil and leaves from the riverbanks.

"Right now what's been found are trace amounts of oil in the form of rainbow sheens," Con Edison spokesman Bob McGee said Monday.

The DEC has not discovered any wildlife injured by the oil spill, but the agency's biologists are checking the contaminated area.

Lori Severino, a spokeswoman for the DEC, declined to say on how long the clean-up might last. McGee said the utility will continue its clean-up until the DEC decides that the problem has been addressed.

McGee said that the utility did not yet have a cost estimate for the work. According to the DEC, there are 73 people involved in the cleanup, including 10 Con Edison employees and 63 workers from an outside contractor.

From Tremont Tribune

ConEd Reacts Quickly to Bronx River Oil Spill, But Concerns Linger

December 7, 2009

THE CLEAN-UP OPERATION IN THE BRONX BOTANICAL GARDEN, HOME TO 1.2 MILES OF THE BRONX RIVER (Photos: P. Egan)

By PATRICK EGAN

In the days before Thanksgiving, dozens of workers in hard hats and orange and yellow vests trudged along the banks of the Bronx River sopping and scooping up the last remnants of a Nov. 4 oil spill from a Consolidated Edison substation in Yonkers.

Conservation experts heralded Con Edison's quick and diligent response but wouldn't go so far as to give the river's ecosystem a clean bill of health.

"We're watching very closely for harm to wildlife," said Linda Cox, who heads the Bronx River Alliance, a non-profit that works to restore and protect the river. "Our concern is more about whether there would be more subtle, longer-term effects."

The spill occured when an explosion at the Dunwoody substation sparked a blaze fueled by dielectric oil, a fluid similar to mineral spirits. "We're still trying to figure out the cause," said Chris Olert, a Con Edison spokesperson.

As emergency crews sought to contain the fire, Olert said, fewer than 100 gallons of oil escaped into the Bronx River, home to bullfrogs, painted turtles, carp and much more.

The New York State Department of Environmental Conservation (DEC) questioned the amount of oil actually spilled. "No one can truly know how much oil entered the river in Yonkers, and any such estimates are somewhat speculative in nature," said Thomas Panzone, a spokesperson, in an e-mail.

Conservationists agree that Con Edison's reaction is an improvement on the ultility company's response the last time it spilled oil into the river seven years ago. Bob Heinisch, who directs site

operations at the New York Botanical Garden, home to about 1.2 miles of the 24-mile Bronx River, remembered far less urgency on ConEd's part in 2002. Some ducks and other wildlife had been soaked in oil.

"It's like night and day," said Heinisch. "Some days they have 60 guys in here."

The Bronx Zoo echoed that opinion. "We haven't had any impact on our part of the river," said John Calvelli, who's in charge of public affairs. "You look at how organizations respond to these crises, and ConEd has done well."

COLLECTION BOOMS HAVE BEEN STRETCHED ACROSS SLOW-MOVING SECTIONS OF THE RIVER TO NET OILY DEBRIS

Throughout most of November, an outfit hired by Con Edison floated a tangle of absorption and collection booms on slow-moving sections of the river, many of which are on the grounds of the Botanical Garden. Absorption booms are tubes of soaking materials that draw oil from the water; workers called them "sausages." Collection booms net oily debris like leaves and grass. A giant machine—like a shop-vac on wheels—near the riverbank sucked all the muck out of the water.

The cleaning crews wrapped up work before Thanksgiving, but will return this month with the DEC to look for residual oil, according to Con Edison.

"We will physically walk every foot of the river with the DEC," said Neil Scow, who handles environmental issues for Con Edison. "We have the same level of concern for the environment as they do."

So far, public awareness of the spill has been minimal, but other stakeholders with an interest in the river's health are keeping a close watch.

"I was deeply concerned to hear about the recent oil spill into the Bronx River," said Congressman José E. Serrano via e-mail. "If this spill isn't thoroughly cleared, we could see some of the environmental progress we have made wiped out."

While the Bronx River Alliance is satisfied with Con Edison's rapid response, it remains concerned about the utility company's safety procedures.

"There are measures built around a transformer to catch oil in such an incident, and I don't think that system worked," said the Bronx River Alliance's Linda Cox.
No one wants a return to the conditions found in the mid-1970s, the height of the Bronx River's decay, when the waterway was polluted and littered with trash.
"We're proud of the fact that we have a lot of eyes on the river," Cox said.
Written by admin · Filed Under Health & Environment, Latest, News/Features

Con Edison Substation Fire Causes Oil Spill on the Bronx River

Oil in a 345,000-volt transformer caught fire just before 5:30 a.m. yesterday, November 4, 2009, at the Dunwoodie substation at 152 Kingston Ave., just west of the state Thruway and 1.5 miles from the Bronx River. Oil from the transformer reached the Bronx River, possibly via storm drains. As of today at 5:30 pm, Con Edison is continuing to work on the cleanup with the NY State Department of Environmental Conservation (DEC) Emergency Response Team and the NY City Department of Environmental Protection (DEP).

Here is a report on the measures we've been taking to monitor and communicate about the spill.

Con Edison notified Linda Cox, Executive Director of the Bronx River Alliance and the Bronx River Adminstrator for the New York City Department of Parks & Recreation, yesterday afternoon around 2 pm. Linda immediately notified NYC Parks, and both the BxRA Conservation Crew and Parks Natural Resource Group staff investigated. Booms placed by Con Edison and DEC to contain and absorb the spill were already in place at several locations along the river. Staff members observed oil slicks and strong petroleum smells along the river, and oil seeping under the booms, heading downriver. The Alliance has been keeping in close contact with Con Edison, Parks and neighboring partners such as the New York Botanical Garden and the Bronx Zoo – all who observed the spill on their sites.

Today the Alliance and NRG investigated sites as far south of Hunts Point Riverside Park and took photographs and water samples. Oil is still being observed and is trapped among rocks at various points along the river, particularly in the Bronx River Forest. Con Edison crews will walk the site to physically assess the situation and take any further action.

The fluid is a dielectric, insulating mineral oil and contains Polychlorinated biphenyls, or PCBs, in "miniscule" amounts – 4 parts per million. (Fluid is considered a PCB contaminant if it contains 50 – 500 parts per million, and is considered PCB if it has more than 500 parts per million.) We recommend that no one enter or disturb the water and that you contact us if you see injured wildlife or other issues at 718.430.4665. We will continue to make updates on this webpage as we know more.

News Release

news release index

O&R Media Relations • Michael W. Donovan • 845-577-2430

O&R Proposes New Electric Substation for New City

PEARL RIVER, NY December 8, 2008 — Orange and Rockland Utilities is planning to invest $9 million to build a new 120MVA electric substation off Little Tor Road in New City that will improve the electric service reliability in the northern New City community.

It's primarily Clarkstown's growth that makes the substation necessary.

The northern New City area's electric service is presently provided by three O&R substations — one in New Hempstead, one in West Haverstraw and one in Congers. Due to ever-increasing electric demand, these substations are already strained to capacity. Between 2009 and 2014, O&R predicts electric usage to continue to grow at 2.13 percent in Rockland County and in the Little Tor area, O&R predicts that growth to be 3.12 percent.

The current situation places O&R and its Clarkstown customers in the vulnerable position of having minimal electric system backup should equipment fail or be damaged by harsh weather, accident or other event. Electric service reliability is something everyone depends on and it results from having an adequate infrastructure in place. This plan aims to provide just that infrastructure.

The substation is designed to occupy less than one acre. The facility is to be centered on a 10.2 acre parcel owned by O&R, which has maintained high voltage electric equipment, including the Gibbons substation for 57 years, on this property since 1926.

O&R had owned 1.27 acres at this site for 80 years. O&R transmission lines bisect that property and a natural gas regulator station has also been located there for many years.

O&R purchased the contiguous 8.93 acres in 2006 to build the substation. The purchased property was the trash-strewn home of a defunct bungalow colony and tainted wells. O&R arranged for the bungalows to be razed, the wells capped and the site cleaned up.

This facility is an entry point to bring more electricity into the area. This is not a power plant. The proposed substation does not generate electricity. The substation takes high voltage electricity from the 138kv overhead transmission wire that has run through this area for decades and converts that electricity to lower voltage. The substation equipment then channels that lower voltage electricity into the electric distribution system that runs up and down the street to deliver the electricity to homes and businesses.

The fence line of the proposed facility is nearly 250 feet from South Mountain Road and 230 feet from Little Tor Road. The two, H-shaped transmission structures inside the facility will be 68 feet high. A lightning arrestor that resembles a flagpole will be 84 feet 5 inches tall. The substation will be built in

compliance with the National Electric Safety Code.

O&R has retained the services of a landscape architect to develop a vegetation installation and maintenance plan to screen the property and its equipment from the public.

The substation will contain two 50 MVA transformers and one 20 MVA transformer (this transformer is dedicated to providing electricity to Tilcon).

After it's completed, O&R's proposed substation will generate virtually no traffic. O&R plans to install high-tech, low-sound equipment in the substation. This equipment typically registers sound at the fence line on a par with an air conditioner.

The current driveway will be moved from South Mountain Road to Little Tor Road. Containment structures within the substation will limit rain runoff.

The substation will be lit only internally and with limited illumination only for emergency repair or maintenance work. Otherwise, the site will remain dark at night. The property will be gated and fenced and high tech systems will be installed to provide security to the structure. Regular maintenance visits by O&R personnel take place during daylight hours once a month.

O&R plans to call for this substation to be operational and on-line by summer 2010.

To build the substation, O&R requires Clarkstown Planning Board approval. That approval includes a review by the Fire Department, the Town Highway Department, the Town Engineer and the other relevant town of Clarkstown departments.

O&R also requires a Special Use Permit from the Clarkstown Zoning Board of Appeals.

Rockland County Highway Department and the Rockland County Drainage agency must also approve the plan.

Clarkstown residents will benefit from the taxes on the proposed facility. O&R currently pays $20,605 on the property. With the construction of the substation, that annual tax bill rises to $230,225. Of that total, $149,748 is school taxes and $80,477 is Rockland County and Clarkstown Town taxes.

As part of this project, the natural gas regulator station now on the property about 50 feet south of South Mountain Road will be upgraded with state-of the-art equipment and moved another 100 feet further away from South Mountain Road, deeper into the property. The cost of that project is $375,000.

Substation Fire In Yonkers

Police: Residents Should Keep Windows Shut

Updated: Wednesday, 04 Nov 2009, 5:59 PM EST
Published : Wednesday, 04 Nov 2009, 6:26 AM EST

- KATHY CARVAJAL
  MYFOXNY.COM

MYFOXNY.COM - Yonkers officials advise residents to keep their windows, doors and ventilation systems shut after a massive fire at the Con Edison substation at 142 Kingston Avenue.

The flames broke out at around 5 a.m. on Wednesday. Firefighters brought the fire under control several hours later. Witnesses reported hearing several explosions at the site. There were no power outages.

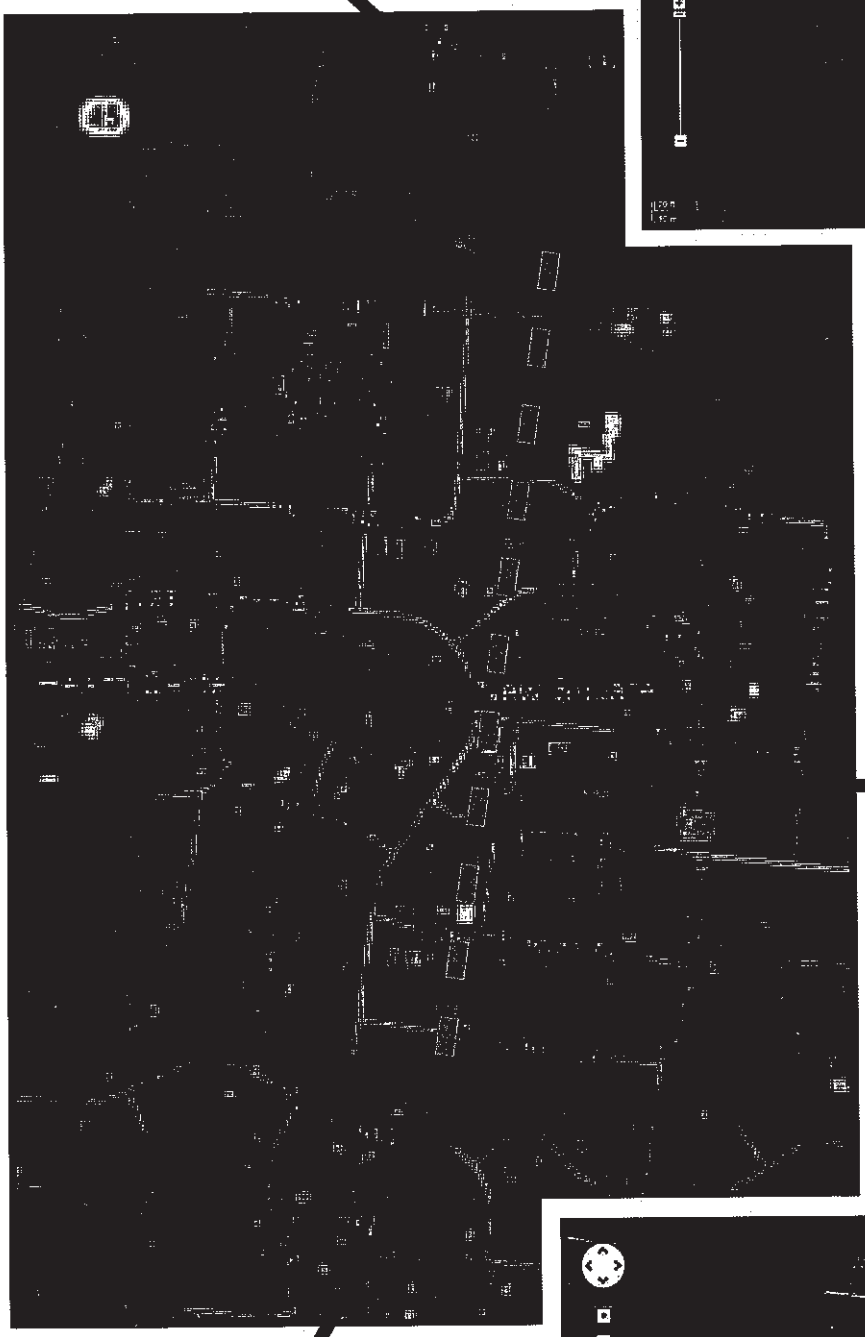
SkyFoxHD was over the scene at around 6 a.m. as firefighters appeared to be getting the upper hand on the flames.

Yonkers Fire Department officials say homes on three streets in the area were evacuated as a precaution. SkyFoxHD Reporter Kai Simonsen said homes in the area did not appear to be in danger.

Massive plumes of smoke could be seen for miles. The New York State Thruway runs near the substation. Smoke covered a portion of the roadway during the morning rush.

An **electrical substation** is used by power companies to transform voltage.

Above Ground 138kV Transmission Line
From New City / South Mtn. Road Area



Underground Transmission
Line Begins Here at Northern
Edge of New Square

Village of New Square

Underground Route of
Transmission Lines

99% of EMF Reduced within
25' of Underground Lines

Benefits of Underground Lines:

- **Reduced Risk of Childhood Leukemia & Other EMF Effects**
- **No Issues of Aesthetics**
- **No Impacts on Property Values**

Above Ground Transmission
Line Re-Emerges Here at
Southern Edge of New Square

Presented June 6, 2012 to the Clarkstown Planning Board by Marvin Baum

Copied for PB mtg. on 6/6/12

Town of Clarkstown

Jose Simoes <j.simoes@clarkstown.org>

Follow-Up Re: South Mountain Road Substation

1 message

Marvin Baum <marvin@baum.tv> Fri, May 25, 2012 at 1:27 PM
To: Shirley Thormann <s.thormann@clarkstown.org>
Cc: Rosalie Cautillo <r.cautillo@clarkstown.org>, Jose Simoes <j.simoes@clarkstown.org>, Bob Geneslaw <rgeneslaw@aol.com>, Shirley Lasker <shirlasker@aol.com>, Terri Thal <thal.terri@gmail.com>, Martus Granirer <martus@granirer.us>, "Walker, Kirsten" <kwalker@enduranceservices.com>

Dear Ms. Thormann:

I am attaching copies of the articles about the Con Edison, Inc., substations in NYC and Westchester that I quoted at the recent Clarkstown Planning Board meeting on the proposed South Mountain Road substation by the Applicant, a division of Con Edison. Both of these substations had the explosions and fires on the very weekend before the Public Hearing. As I stressed at the meeting, the euphemistic language, descriptions of risks and emergency planning in the O&R DEIS were totally inadequate.

In my presentation, I also referred to several other explosions and fires experienced by Con Edison, Inc., including a massive explosion and fire in November 2009 at the Dunwoodie Substation in Yonkers, which was followed by an oil spill in the Bronx River two miles away as a result of this fire. Several months later in June 2010, that substation experienced another explosion/fire. I am attaching articles and photos about the first Dunwoodie "event" and subsequent oil spill.

Other major explosions and fires at substations have taken place in recent weeks and months at other utility company substations across the country including in Edison (http://www.nj.com/news/index.ssf/2012/02/edison_transformer_fire_shoots.html), Boston (http://www.reuters.com/article/2012/03/14/us-boston-fire-idUSBRE82D0DS20120314), Portland (http://www.wmtw.com/Substation-Fire-Causes-Portland-Power-Outage/-/8792672/9569452/-/11x0ue0z/-/index.html) and New Orleans (http://www.fox8live.com/story/18406268/fire-at-power-substat). The most recent substation fire took place just hours ago in Ashville and was caused by a black snake: (http://www.citizen-times.com/article/20120525/NEWS/305240057/Black-snake-blamed-electrical-substation-fire-near-Asheville?odyssey=tab%7Ctopnews%7Ctext%7CFrontpage)

Here are the two videos that I showed at the meeting of substation explosions and fires:

http://youtu.be/WkDCS8xeobg

http://youtu.be/pdDolznk9eY

With the dangers demonstrated by these videos, the links to recent substation "events," and the attached articles, I have a particular concern about the proposed location, which will also be the site of a gas line regulator. Take a look at what happened some years ago in Edison, NJ: http://www.youtube.com/watch?v=NyMbaZ9FVjA

More recently, a massive deadly gas line explosion took place in California: http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2010/09/09/BADP1FBJRS.DTL

The O&R DEIS does not at all address the potential risks associated with the co-location of the substation and gas regulator facilities. Do these two facilities together pose an increased risk to the safety of residents in Clarkstown that either would if located separately? I would like to request that this question be addressed by the Planning Board.

Also, I'd like to request that this email be forwarded to all members of the Clarkstown Planning Board so that they can review these materials.

Thank you very much.

Sincerely,

Marvin Baum

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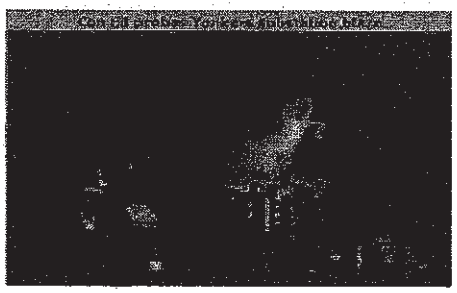
12 attachments



ScreenHunter_10 Dec. 19 21.53.jpg
18K

Town of Clarkstown

Diane Papenmeyer <d.papenmeyer@clarkstown.org>

Fwd: Medical Experts for EMF Health Issues at Proposed O&R Substation

1 message

Jose Simoes <j.simoes@clarkstown.org> Thu, Jun 21, 2012 at 11:01 PM
To: Diane Papenmeyer <d.papenmeyer@clarkstown.org>

Another e-mail from Marvin to print out for Shirley and the file and even more attachments..

---------- Forwarded message ----------
From: **Marvin Baum** <marvin@baumimagegroup.com>
Date: Thu, Jun 21, 2012 at 4:43 PM
Subject: Medical Experts for EMF Health Issues at Proposed O&R Substation
To: s.thormann@clarkstown.org
Cc: Jose Simoes <j.simoes@clarkstown.org>, Shirley Lasker <shirlasker@aol.com>, Martus Granirer <martus@granirer.us>, Terri Thal <thal.terri@gmail.com>, JHOL49@aol.com, Mark Gilliland <mg@markg.org>, Patricia Podolak <vze27vte@verizon.net>, Amy Kupferberg <artgirl22@earthlink.net>, christopher.crane@yahoo.com, annejaffeholmes@me.com, Susan Porcino <sporcino@hotmail.com>, Walter Rodriguez <wrodriguez@tasrc.com>, "Walker, Kirsten" <kwalker@enduranceservices.com>, Ed Day <legislatorday@yahoo.com>, Peter Vitro <pobrod46@aol.com>, Bob McGloughlin <litmc2@aol.com>, Bob Geneslaw <rgeneslaw@aol.com>, a.mele@clarkstown.org

Dear Ms. Thormann:

As I stated at the June 6, 2012, Public Hearing on the O&R DEIS for the proposed New City substation, I believe that the Town of Clarkstown should retain high-level medical experts to review this project and its potential public health consequences. While I very much appreciate Mr. Leifer's broad knowledge in the electrical technology field, he is not a medical or environmental health expert. Therefore, I do not believe it would be appropriate to rely on him to evaluate the medical studies that I (or others) submitted to the Board or issue a medical opinion regarding the Applicant's proposal.

I am attaching information on Prof. David Carpenter, a Harvard-trained physician and environmental health specialist at the University at Albany (SUNY) with extensive experience in EMF-related health issues. Dr. Carpenter is considered one of the top medical experts in this field.

I'm also attaching a CV for Dr. Carl Baum (no relation) of the Yale University School of Medicine, as a secondary expert to consult on EMF health issues. Dr. Baum's expertise is in pediatric toxicology.

Both Dr. Carpenter and Dr. Baum have indicated a willingness to provide consulting services on this project for the Town of Clarkstown. Their contact information is below.

Please include this email as part of the public record on this matter.

Thank you very much.

Sincerely,

Marvin Baum

David O. Carpenter, M.D.

Director, Institute for Health and the Environment

University at Albany

5 University Pl., Rm. A217

Rensselaer, NY 12144

518-525-2660 (phone)

518-525-2665 (FAX)

Email: dcarpenter@albany.edu

Carl Baum, MD, FAAP, FACMT | Associate Professor of Pediatrics | T 203.641.TOXI (8694) | http://toxikid.org

Yale University School of Medicine | Center for Children's Environmental Toxicology | Yale-New Haven Children's Hospital

~|~

5 attachments

- **Brief bio-EMF.doc** 26K
- **Carpenter_CV.docx** 89K
- **310 REH-EMF.pdf** 662K
- **Cancer Panel.doc** 77K
- **Baum CV Promotion.doc** 103K

David O. Carpenter is a public health physician whose current position is Director of the Institute for Health and the Environment at the University at Albany, as well as Professor of Environmental Health Sciences within the School of Public Health at the University at Albany. After receiving his MD degree from Harvard Medical School he chose a career of research and public health. After research positions at the National Institute of Mental Health and the Armed Forces Radiobiology Research Institute, he came to Albany in 1980 as the Director of the Wadsworth Center for Laboratories and Research of the New York State Department of Health, the third largest public health laboratory in the US after NIH and CDC. In an effort to build ties to an academic program, he initiated efforts to create a partnership between the New York State Department of Health and the University at Albany, resulting in the creation of the School of Public Health in 1985. He was then appointed as the founding Dean of the School of Public Health, a position he held until 1998 when he became the Director of the Institute of Health and the Environment.

Dr. Carpenter's research initially was basic neurobiology, and more recently has primarily been the study of human disease resulting from exposure to environmental contaminants. He has focused on the relationship between exposures to a variety of chemicals and ionizing radiation on incidence of several human diseases, including diabetes, hypertension, heart disease and diseases of the nervous system. He has extensive international scientific collaborations in Japan, China, Uganda, Pakistan, Turkey and Russia. The Institute which he directs has recently been identified as a Collaborating Center of the World Health Organization. Dr. Carpenter is also a member of the Science Advisory Board of the International Joint Commission, an organization that advises the governments of the US and Canada on issues related to the Great Lakes. He has more than 350 peer reviewed publications and has edited five books.

When he arrived in Albany in 1980 as the Director of the Wadsworth Laboratories of the New York State Department of Health, he was given the responsibility of administering a program to determine whether there were adverse human health effects of electromagnetic fields (EMFs), initiated because of concern of hazards from high voltage powerlines. A 5 million dollar research program was begun, and when finished in 1987 the program concluded that while there were effects of EMFs on many organ systems, a particular concern was an increased incidence of leukemia in children living in home with elevated magnetic fields. After that time Dr. Carpenter became for the spokesperson for New York State on issues related to EMFs. He has continued to evaluate research in this area, and has edited two books and written several review articles on the subject. He testified before the President's Cancer Panel in 2009 on human health effects of both power line and radiofrequency EMFs from a variety of sources, particularly from cell phones.

FOR 6/13/12 PB MTG.

Town of Clarkstown

Jose Simoes <j.simoes@clarkstown.org>

Information on Substation Design + O&R's Suburban Underground Transmission System in the Village of New Square

1 message

Marvin Baum <marvin@baumimagegroup.com> Fri, Jun 8, 2012 at 9:39 AM
To: Shirley Thormann <s.thormann@clarkstown.org>
Cc: Bob Geneslaw <rgeneslaw@aol.com>, Jose Simoes <j.simoes@clarkstown.org>, Shirley Lasker <shirlasker@aol.com>, Amy Mele <a_mele@town.clarkstown.ny.us>, Martus Granirer <martus@granirer.us>, Terri Thal <thal.terri@gmail.com>, "Walker, Kirsten" <kwalker@enduranceservices.com>, Mark Gilliland <mg@markg.org>, artgirl22@earthlink.net, Patricia Podolak <vze27vte@verizon.net>, annejaffeholmes@me.com, Susan Porcino <sporcino@hotmail.com>, Walter Rodriguez <wrodriguez@tasrc.com>, JHOL49@aol.com, Rosalie Cautillo <r.cautillo@clarkstown.org>, Peter Vitro <pobrod46@aol.com>, Bob McGloughlin <litmc2@aol.com>

Dear Ms. Thormann:

I am attaching information about the Roosevelt Park Substation in Irvine, California. Most of that suburban community's transmission facilities (lines & substations) are above ground, just like O&R's, but this substation, which was built at a distance from the existing transmission lines, was nevertheless **built completely underground**. Including the design and installation of the above ground park, 10 linear miles of underground transmission lines and various structural accommodations to withstand substantial seismic activity, this attractive facility cost about $19 million -- just a couple of million more than the latest cost estimate of O&R's proposed substation on South Mountain Road.

By using the underground design, the size of the substation was greatly reduced. The benefits of this underground design approach include substantially reduced EMF impacts (health concerns, etc.) and the virtual elimination of property value, noise and aesthetic concerns. I also assume that the risk of fire would largely be contained within the building and not pose the type of threat to a densely wooded area that the proposed substation in northern New City would.

As I mentioned at the Planning Board meeting on Wednesday, O&R has already put the transmission lines from the South Mountain Road area completely underground in New Square, which offers that community many of the benefits that I outlined on EMF, aesthetic and property value issues. I am attaching some of the images that I presented at the meeting for your reference. **Are the people of Clarkstown less "entitled" to the advantages of this approach than the people of New Square?**

I think it would be very interesting to know how New Square was able to have all of its transmission lines placed underground, as well as the projected cost and benefits for doing this elsewhere in Clarkstown, particularly related to the proposed substation in New City. Isn't it time we finally modernize our electric delivery system to make it safer, more reliable and more "neighbor friendly?"

Here's an article from the NY Times about putting substations underground:

http://cityroom.blogs.nytimes.com/2009/01/16/why-not-bury-ugly-substations/

The following article talks about substation design/aesthetics:

http://www.nytimes.com/2008/08/05/nyregion/05substation.html?_r=1&pagewanted=all (Note: Con Ed used the Switzer Group for the exterior design of some of its newest substations. Con Ed is investing billions in new substations in NYC, and the designs are intended to overcome community opposition, as indicated in the article.)

Below is information on Con Ed's new Academy Substation in northern Manhattan. As you can see, the design of this substation is very beautiful. Interestingly, the electricity for this substation comes via Westchester County. No similar efforts have been made by Con Edison to enhance substation appearance or design in that community basically because they've been able to get the approvals they need without making the types of concessions they need to make in NYC to get the approvals.

Con Ed did need to put part of the lines feeding the Academy Substation underground in Yonkers because of practical considerations (i.e. not having to purchase new ROWs over existing structures, which would have been far more expensive), but the City of Yonkers did have major problems with Con Edison over this project, and just getting them to fix the roads that were broken up to install the transmission lines (rather than accept the substandard roadway "patches" Con Ed provided) were a big source of contention. Con Edison could never have gotten away with this type of behavior in New York City. Also, on this project, Con Edison buried the transmission lines under the East River, which cost far more than both "regular" burying of transmission lines or installing overhead lines. Needless to say, New York City would never have approved an overhead transmission line due to aesthetic concerns and a standard underground installation was not possible since Manhattan is surrounded by water.

http://www.coned.com/publicissues/M29_PDF/Text/Exhibit10Academy_Substation.pdf

In the pictures below, notice the unique nautical design (including a faux lighthouse, blue colors and sail-like design elements) implemented to enhance the waterfront appearance of this substation.

O&R Letter

Debbie Tretola

From: Jose Simoes [j.simoes@clarkstown.org]
Sent: Friday, June 08, 2012 10:25 AM
To: Anthony Montalbano
Subject: Fwd: Information on Substation Design + O&R's Suburban Underground Transmission System in the Village of New Square
Attachments: IMG_0491.JPG; ParkSubinTDWorld.pdf; Underground New Square Transmission Lines.pdf; Close-In of New Square.pdf

---------- Forwarded message ----------
From: **Marvin Baum** <marvin@baumimagegroup.com>
Date: Fri, Jun 8, 2012 at 9:39 AM
Subject: Information on Substation Design + O&R's Suburban Underground Transmission System in the Village of New Square
To: Shirley Thormann <s.thormann@clarkstown.org>
Cc: Bob Geneslaw <rgeneslaw@aol.com>, Jose Simoes <j.simoes@clarkstown.org>, Shirley Lasker <shirlasker@aol.com>, Amy Mele <a_mele@town.clarkstown.ny.us>, Martus Granirer <martus@granirer.us>, Terri Thal <thal.terri@gmail.com>, "Walker, Kirsten" <kwalker@enduranceservices.com>, Mark Gilliland <mg@markg.org>, artgirl22@earthlink.net, Patricia Podolak <vze27vte@verizon.net>, annejaffeholmes@me.com, Susan Porcino <sporcino@hotmail.com>, Walter Rodriguez <wrodriguez@tasrc.com>, JHOL49@aol.com, Rosalie Cautillo <r.cautillo@clarkstown.org>, Peter Vitro <pobrod46@aol.com>, Bob McGloughlin <litmc2@aol.com>

Dear Ms. Thormann:

I am attaching information about the Roosevelt Park Substation in Irvine, California. Most of that suburban community's transmission facilities (lines & substations) are above ground, just like O&R's, but this substation, which was built at a distance from the existing transmission lines, was nevertheless **built completely underground**. Including the design and installation of the above ground park, 10 linear miles of underground transmission lines and various structural accommodations to withstand substantial seismic activity, this attractive facility cost about $19 million -- just a couple of million more than the latest cost estimate of O&R's proposed substation on South Mountain Road.

By using the underground design, the size of the substation was greatly reduced. The benefits of this underground design approach include substantially reduced EMF impacts (health concerns, etc.) and the virtual elimination of property value, noise and aesthetic concerns. I also assume that the risk of fire would largely be contained within the building and not pose the type of threat to a densely wooded area that the proposed substation in northern New City would.

As I mentioned at the Planning Board meeting on Wednesday, O&R has already put the transmission lines from the South Mountain Road area completely underground in New Square, which offers that community many of

the benefits that I outlined on EMF, aesthetic and property value issues. I am attaching some of the images that I presented at the meeting for your reference. **Are the people of Clarkstown less "entitled" to the advantages of this approach than the people of New Square?**

I think it would be very interesting to know how New Square was able to have all of its transmission lines placed underground, as well as the projected cost and benefits for doing this elsewhere in Clarkstown, particularly related to the proposed substation in New City. Isn't it time we finally modernize our electric delivery system to make it safer, more reliable and more "neighbor friendly?"

Here's an article from the NY Times about putting substations underground:

http://cityroom.blogs.nytimes.com/2009/01/16/why-not-bury-ugly-substations/

The following article talks about substation design/aesthetics:

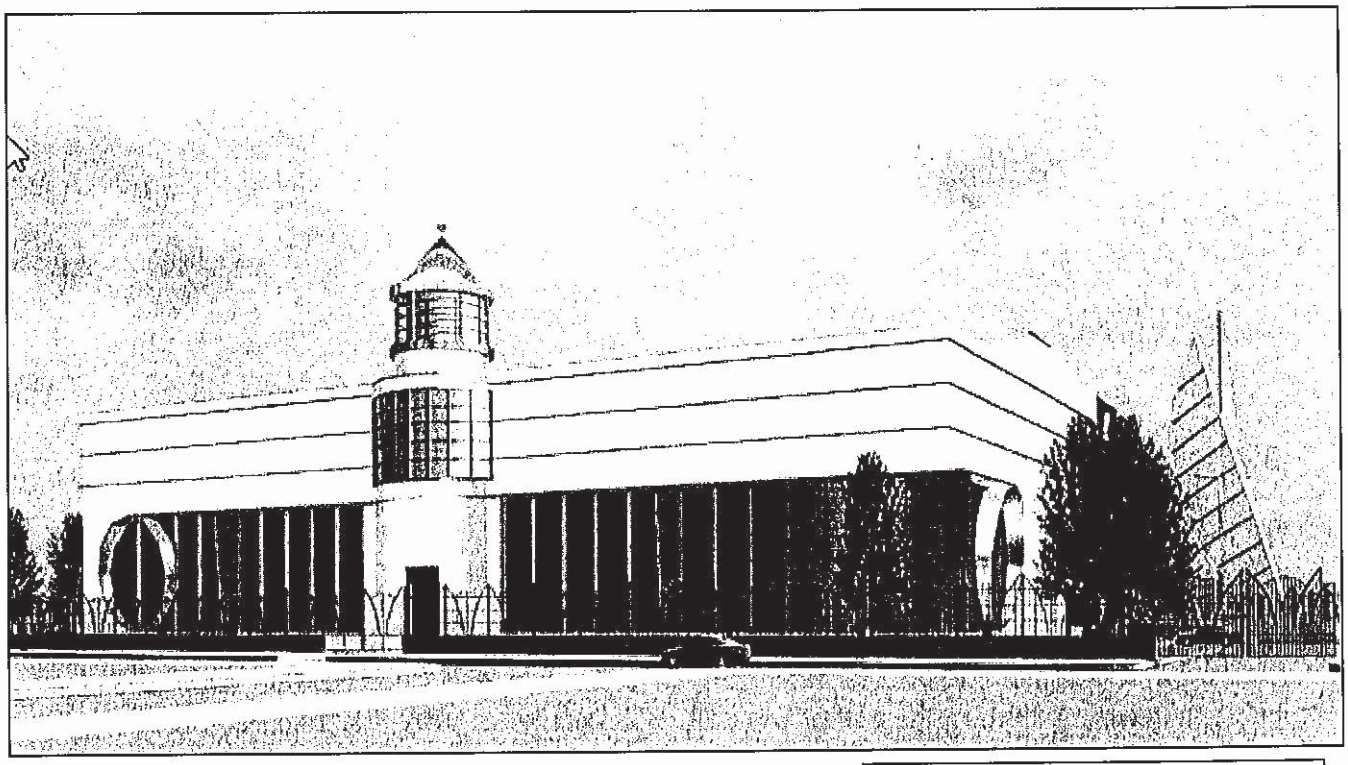
http://www.nytimes.com/2008/08/05/nyregion/05substation.html?_r=1&pagewanted=all (Note: Con Ed used the Switzer Group for the exterior design of some of its newest substations. Con Ed is investing billions in new substations in NYC, and the designs are intended to overcome community opposition, as indicated in the article.)

Below is information on Con Ed's new Academy Substation in northern Manhattan. As you can see, the design of this substation is very beautiful. Interestingly, the electricity for this substation comes via Westchester County. No similar efforts have been made by Con Edison to enhance substation appearance or design in that community basically because they've been able to get the approvals they need without making the types of concessions they need to make in NYC to get the approvals.

Con Ed did need to put part of the lines feeding the Academy Substation underground in Yonkers because of practical considerations (i.e. not having to purchase new ROWs over existing structures, which would have been far more expensive), but the City of Yonkers did have major problems with Con Edison over this project, and just getting them to fix the roads that were broken up to install the transmission lines (rather than accept the substandard roadway "patches" Con Ed provided) were a big source of contention. Con Edison could never have gotten away with this type of behavior in New York City. Also, on this project, Con Edison buried the transmission lines under the East River, which cost far more than both "regular" burying of transmission lines or installing overhead lines. Needless to say, New York City would never have approved an overhead transmission line due to aesthetic concerns and a standard underground installation was not possible since Manhattan is surrounded by water.

http://www.coned.com/publicissues/M29_PDF/Text/Exhibit10Academy_Substation.pdf

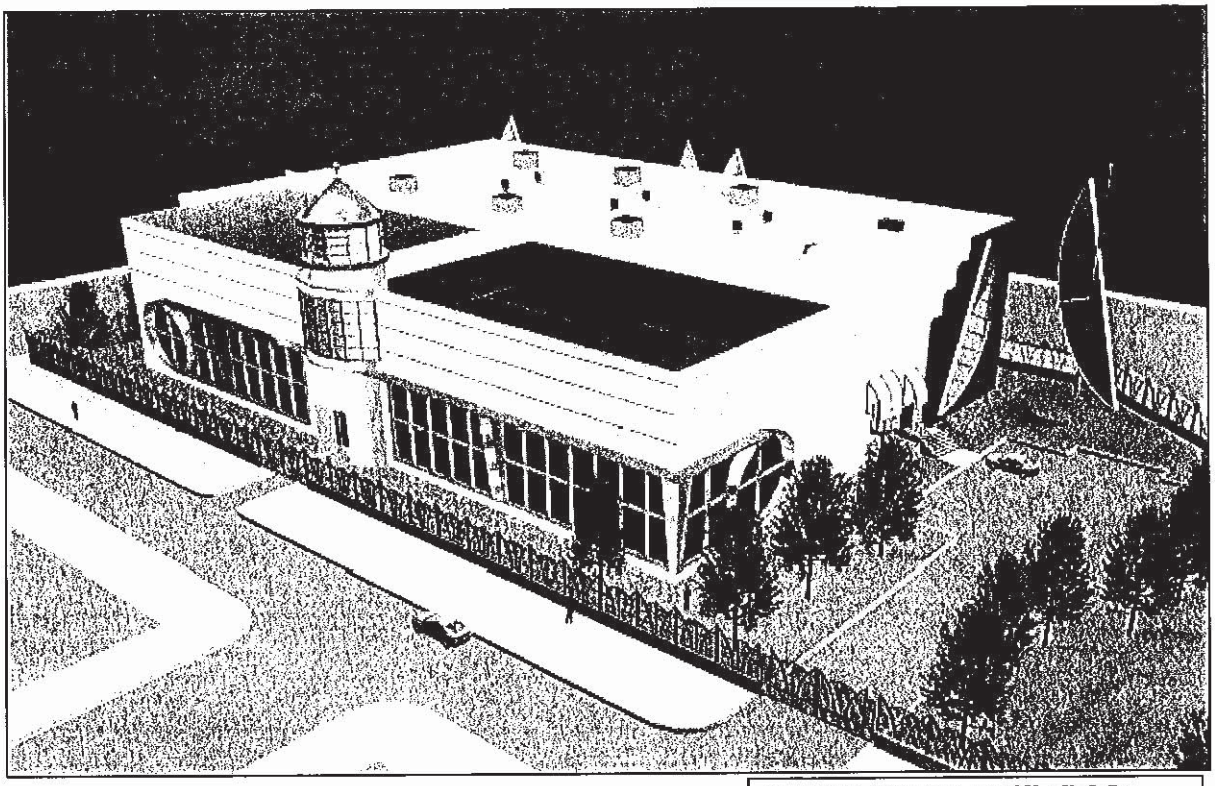
In the pictures below, notice the unique nautical design (including a faux lighthouse, blue colors and sail-like design elements) implemented to enhance the waterfront appearance of this substation.



Consolidated Edison Company of New York, Inc.
M29 Transmission Line Project
Westchester, Bronx and New York Co., New York

Figure 10.4: Project Rendering (View Looking South from West 201st Street)

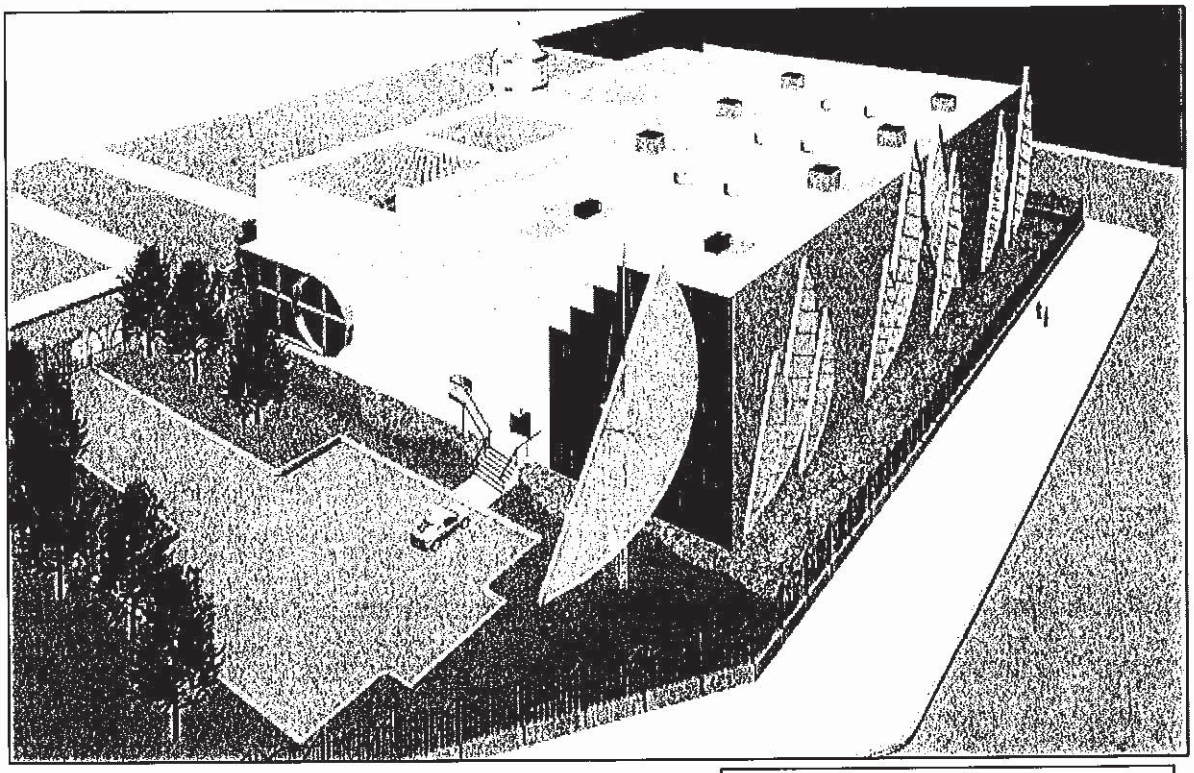
Source: Swanke Group, Inc., July 2006



Consolidated Edison Company of New York, Inc.
M29 Transmission Line Project
Westchester, Bronx and New York Co., New York

Figure 10.5: Project Rendering (Aerial View Looking Southeast)

Source: Swanke Group, Inc., July 2006



Consolidated Edison Company of New York, Inc.
M29 Transmission Line Project
Westchester, Bronx and New York Co., New York

Figure 10.6: Project Rendering (Aerial View Looking Northeast)

Source: Swanke Group, Inc., July 2006

Please distribute this information for review and consideration by members of the Clarkstown Planning Board and all other interested parties, including O&R.

Thank you.

Sincerely,

Marvin

Marvin Baum

Safety & Training 30 | Distribution Design 46 | AMR Infrastructure 60

APRIL 2007

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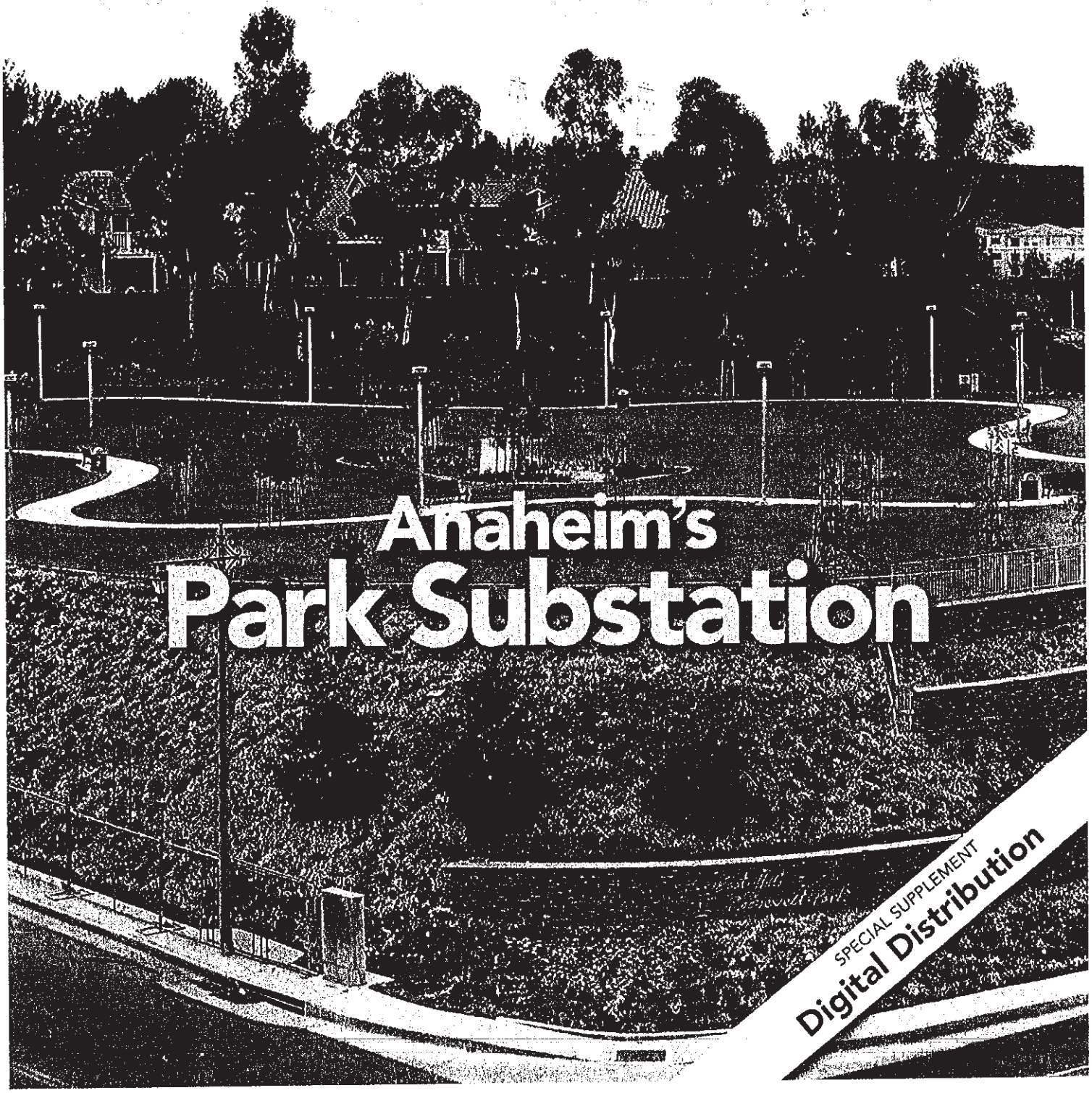


Anaheim's Park Substation

SPECIAL SUPPLEMENT
Digital Distribution

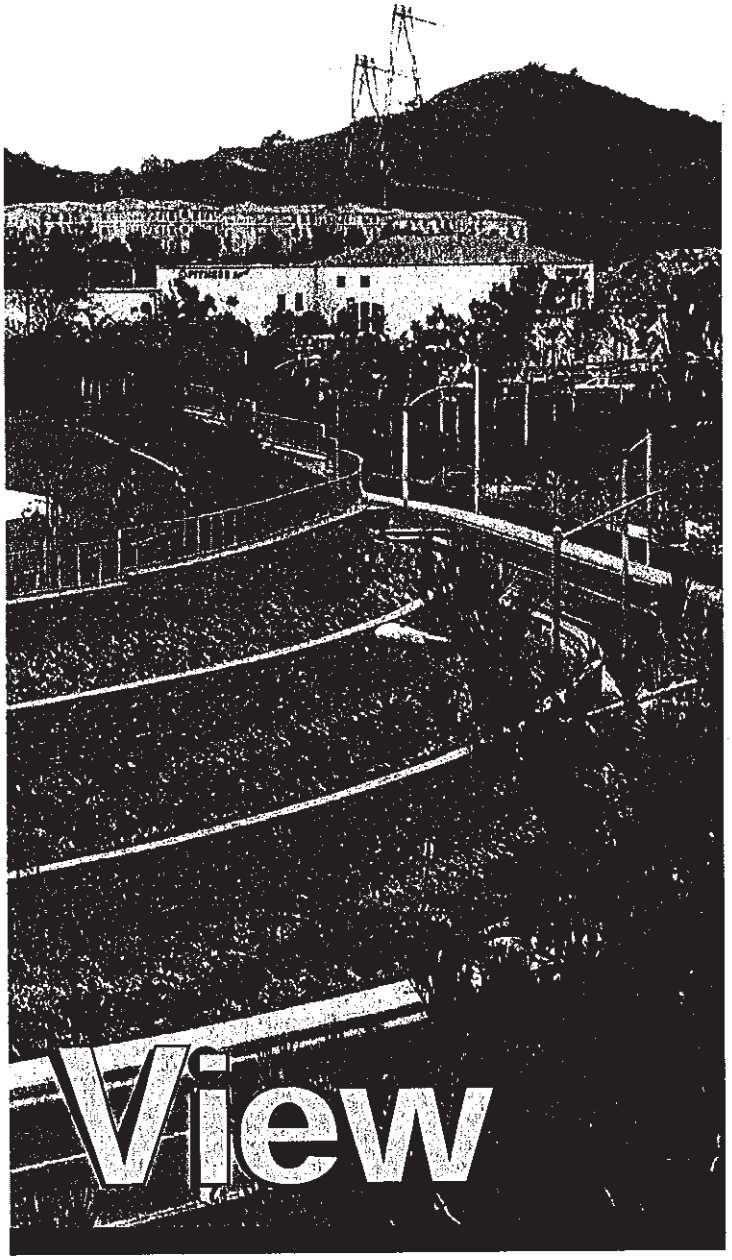
Hidden Within

Cleverly disguised within a community park, Anaheim Public Utilities installs the first subterranean GIS substation in the United States.

By **Jafar Taghavi** *and* **Keith Tieszen**, *Anaheim Public Utilities*

CAMOUFLAGED BY A NEIGHBORHOOD PARK IN A DENSELY POPULATED RESIDENTIAL AREA of Anaheim, California, U.S., is a subterranean gas-insulated switchgear (GIS) 69-kV/12-kV distribution substation. Only a single, partially exposed section of wall provides access and a clue as to the location of Park Substation. The park and adjoining slopes are landscaped and terraced to blend with the surrounding hillsides. The Anaheim community became involved in the project early on and offered strong support for it.

Anaheim Public Utilities, a department within the City of Anaheim, operates one of the oldest municipal electric systems in the state of California and is Orange County's only publicly owned electric utility. The utility has been an energy provider for more than 112 years, has more than 113,000 electric meters and recorded a 535-MW system peak in the summer of 2006. The utility receives power via a 230-kV/69-kV substation and distributes power to its customers through ten 69-kV/12-kV substations.



The park before substation construction began (above), and the completed Roosevelt Park as it is today (left).

SYSTEM STUDIES

The utility's Electric System Planning department concluded that locating a substation in a densely populated area was required to reliably and economically serve current and future load growth. As the city's diverse economy continues to grow and its demand for energy rises, land in the area is becoming increasingly expensive. Environmental and aesthetic issues need to be mitigated. Reliability and safety are becoming more important, and the ability of equipment to withstand seismic events is of critical importance.

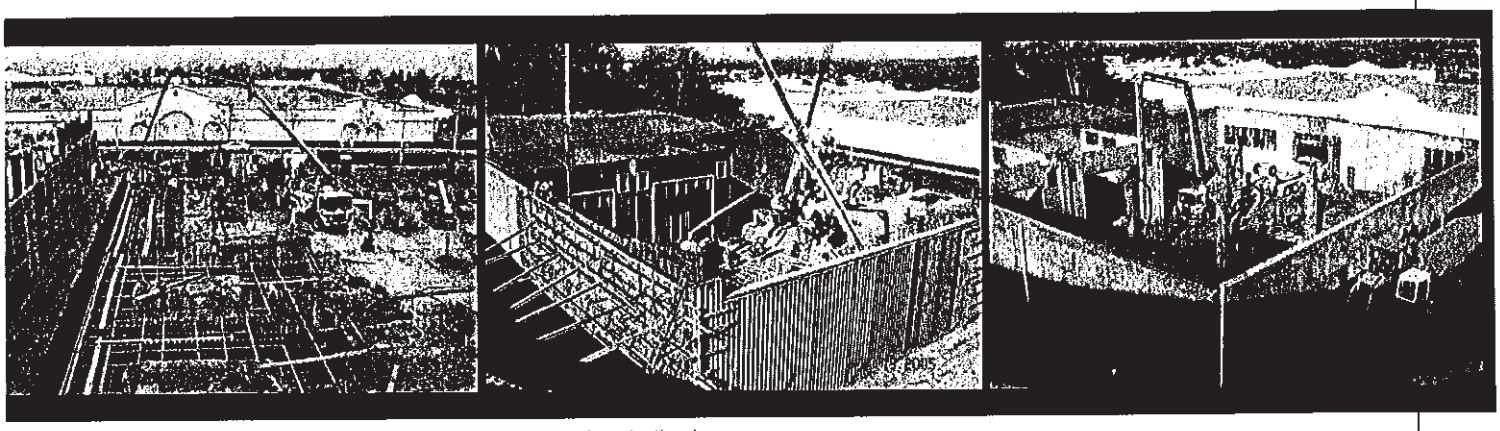
Although a site for future expansion was selected more than three decades ago, it proved to be too small to accommodate today's conventional outdoor station requirements. A conventional substation would have been unacceptable in an area where land is valued in millions of dollars per acre and where existing electrical facilities were already located underground.

The System Planning department's studies concluded that GIS technology would allow the placement of a substation near a load center using only 30% of the land of a conventional substation. GIS also provided the flexibility to make the station quiet and virtually invisible to the public.

During the conceptual stages of the Park Substation project, System Planning contacted the main suppliers of GIS equipment to investigate their equipment capabilities and design-build experiences. Each manufacturer made presentations to Anaheim's key players. As a result, a comprehensive GIS functional specification was prepared to outline major items of work for the contractor. It listed applicable standards and codes, required rating of equipment, factory and field testing, quality assurance, inspection and maintenance, operating requirements, shipping requirements, field service and training, warranty of equipment, wiring requirements, protective relaying, controls, communication, high-voltage cable requirements and connections, and design and construction criteria.

Use of GIS also achieved the overall planning objectives of system reliability and improving community aesthetics, and was an acceptable approach for serving the customers and community. Although the innovative use of GIS is more common in Europe and Japan, its use in the United States is increasing, with aesthetically treated structures drawing more interest. Anaheim's installation, however, is the first underground substation with a park constructed on top of its roof.

System Planning faced formidable obstacles in getting this installation approved. An environmental study was required with its problematic outcome. Land, already scarce, located near a load center had to be acquired. Community concerns had to be mitigated. Design-build contracts were not allowed by the city and required a charter change. The utility had to prepare a comprehensive functional bid specification and provide project management without an increase in staff. However, the utility did have considerable experience managing diverse construction projects, and the Southern California area provided ample technical skills.



Construction sequence ending with a photo during dedication.

COMMUNITY INVOLVEMENT

System Planning evaluated three city-owned sites located near load centers. Each site was capable of serving expanding development, backing up existing distribution circuits and affording short transmission lines. The selected site provided more unencumbered front footage for T&D access, more area for substation construction and offered the best vehicle access.

The substation is approximately 20 ft (6 m) above street level on the north side and located in hilly terrain, with adjacent terraced residential construction and gradual slopes throughout the area. The park buffers several single-family residences overlooking from and immediately adjacent to the west. A street separates the site from single-family residences overlooking from the south. The northerly and west sides are elevated above streets. This type of design allows the substation entrance to blend with the adjacent landscaped greenbelts. The roof of the structure is approximately 4 ft (1.2 m) beneath the park.

System Planning organized and participated in extensive community outreach: It held neighborhood meetings, contacted numerous affected businesses, opened communication lines with residents and businesses, discussed the project with local media and encouraged newspaper articles. Comments and participation in the design process of the neighborhood park were requested and incorporated. A monthly newsletter with the progress schedule was placed at the site to keep local residents informed.

CONTRACT MANAGEMENT

State statutes and the city's charter and municipal ordinances provide specific legal guidelines concerning the soliciting, evaluating and awarding of public works contracts. The design, build and construct contracting for this project required a city ordinance change. After considerable internal review, the city council approved an ordinance that allowed for design-build contracts for the public utilities department.

The major change to the typical public works process is that the award required the contractor to provide and manage the equipment procurement, fabrication and delivery, to provide all design and construction, and to be completely responsible for the end product. Additionally, city staff are allowed to negotiate for a best and final offer.

As a result, the project was ultimately advertised for bid and awarded to a project design and construction team joint venture headed by Siemens Power Transmission & Distribution Inc. (Raleigh, North Carolina, U.S.), a supplier of GIS equipment. The project was managed by Anaheim Public Utilities System Planning staff, in partnership with Sargent & Lundy, LLC (Chicago, Illinois, U.S.), an internationally renowned engineering firm with extensive experience involving GIS substations, which provided the construction management.

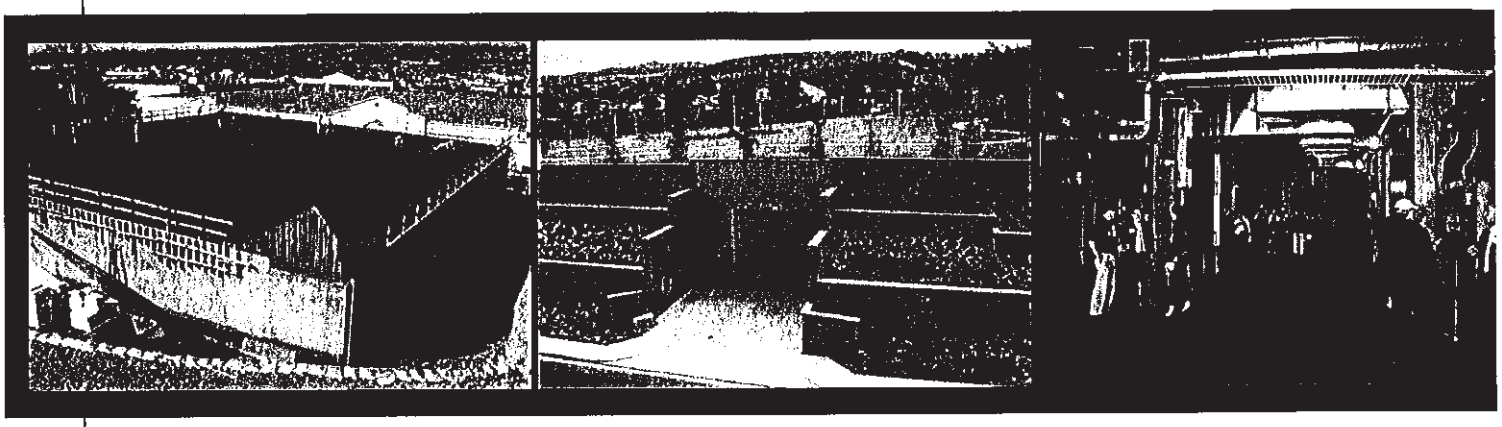
As a design-build project, the contractor was responsible for engineering, procurement of the material and construction of the facility. The design-build team consisted of three companies: Siemens Power T&D; Turner Construction Co. (New York, New York, U.S.), a general contracting firm; and BETA Engineering California LP, a highly experienced specialty electrical engineering firm.

DESIGN AND CONSTRUCTION

The contractor used mass-grading excavation equipment to prepare the site for the cast-in-place concrete structure. All excavation activities occurred during normal working hours to minimize the noise impact to the neighborhood, and lasted approximately 20 days. The 110-ft by 130-ft (34-m by 40-m) excavation required the removal of 225,000 ft^3 (172,000 m^3) of dirt. Sufficient land was available for the excavation to be sloped to eliminate the need for shoring. All foundations were machine excavated. Water trucks were used for dust control during all mass-excavation operations, and daily street cleaning was performed.

However, the start of excavation for the underground building experienced an initial hurdle. Southern California received record rainfall in excess of 35 inches (890 mm) in the fall of 2005. This resulted in the installation of an extensive shoring support system with drilled 40-ft (12-m) concrete-encased I-beams to secure an adjacent slope. There were several homes overlooking the slope, and there was no subsequent soil subsidence.

The foundation rests on concrete pile caps placed over more than 138, 2-ft (610-mm)-diameter drilled caissons with a perimeter concrete-grade beam. The slab on grade is approximately 12 inches (305 mm) thick. The perimeter walls



are 20-inch (508-mm)-thick cast-in-place concrete, and the roof deck is an 18-inch (457-mm)-thick concrete slab with 540 post-tensioned cables.

The building structure (including entrance and exit doors, walls, roof support, fire rating, moisture proofing, safety requirements and noise abatement) was designed and constructed to meet all required codes. The design is compact yet allows for easy access to all equipment. It incorporates a pitched roof with a waterproof membrane treatment applied to the roof, exterior walls and retaining walls. A perforated drainpipe system was placed at the bottom of the exterior walls.

The ventilation system serving the transformer vault and vehicle access area is a direct evaporative cooling unit located in the mechanical room. The unit duty is sized for 30,000 cubic feet per minute (CFM). The air volume is based on the equipment design heat-load values.

Fresh air is provided by acoustic louvers in the exterior wall of the mechanical room, which also serves as a fresh-air plenum. Equipment areas have in-line centrifugal exhaust fans with a fan duty sized for 30,000 CFM. Exhaust air for vehicular traffic is through five inlets located within 18 inches (457 mm) of the finished floor.

Conventional air conditioning typically found in computer room-type cooling provides conditioned air (HVAC) for the control room and the ac-dc rooms. HVAC sizing is based on an interior heat load of 25 W/sq ft of area plus overhead lighting. Design temperature for these rooms is 75°F (24°C). The floor-mounted HVAC units are located in their respective rooms at floor level. Each HVAC unit consists of ductwork, compressor section, electric reheat coil, humidifier, 30% filtration and refrigerant piping between the unit and condensers.

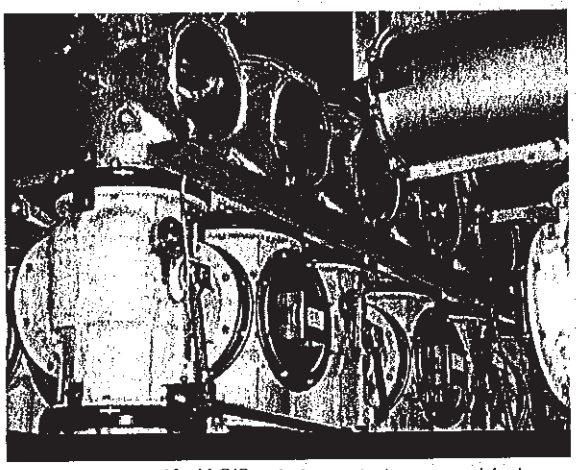
The intake and exhaust louvers are not visible from the community park or street. The louvers are located within the terraced wall of the substation, hidden by the terracing and landscape planting.

Fire protection for the building was achieved through use of an extinguishing agent called HFC-125, a DuPont product that is safe, clean and electrically nonconductive. The goal of this action was to protect people, minimize loss or damage to equipment, and maintain business continuity.

GIS TECHNOLOGY

Gas-insulated switchgear (GIS) is a proven technology used throughout the world that offers many advantages over a conventional substation. A primary advantage is its compactness, which allows a GIS to be placed closer to a load center, and it is a more aesthetically attractive alternative for a neighborhood. It requires less field construction work, resulting in quicker installation time, reduced maintenance, higher reliability and safety, and excellent ability to withstand seismic events.

All switchgear is enclosed in an inert, nontoxic insulating gas medium, which allows the phase spacing of the electric components to be very close and protects the components from outside contamination. GIS compartments on the equipment are continuously monitored to ensure that any leaks are detected and eliminated. It has low noise emission, and reduced fire and explosion potential. Cost benefits accrue over the life of the equipment because of greatly reduced inspection and maintenance requirements.



A portion of the 12-kV GIS switchgear being assembled.

When all these advantages are taken into consideration, a gas-insulated substation is a cost-effective alternative to a conventional substation in an urban community.

Service and maintenance vehicles access the facility through a 20-ft wide by 18-ft high (6-m by 5-m) roll-up door. A main vehicle-access aisle within the building provides access to the 69-kV GIS equipment, two 50-MVA 69-kV/12-kV power transformers, five 69-kV lines, twelve 12-kV distribution circuits and two 12-kV capacitor banks. Sufficient maintenance and service aisles throughout the building provide easy maintenance access, removal and replacement of all equipment.

Connections from the GIS to the high-voltage and low-voltage sides of the transformers were made via 69-kV and 12-kV underground cable installed in PVC conduit duct banks located beneath the building floor slab. Open-air flexible cable was used to connect the cable terminators to the high-voltage and low-voltage bushings of the transformers.

SUBSTATION DEDICATION

On Oct. 17, 2006, Anaheim dedicated the project as Park Substation. It is the first underground 69-kV/12-kV GIS electric distribution substation in the United States. Adding to the uniqueness of the substation is the fact that it sits below the new Roosevelt Park, a two-acre community park that serves the surrounding east Anaheim neighborhood. TDW

Jafar Taghavi is responsible for system planning and major capital project management for Anaheim Public Utilities. He has more than 25 years of experience in the areas of utility and consulting engineering. Taghavi managed Park Substation as well as a 230-kV GIS substation and associated transmission line, now under construction. He is also responsible for an upcoming 69-kV/12-kV indoor GIS substation to be located in a historical-looking building in downtown Anaheim and another upcoming project consisting of a 200-MW generation plant with GIS switchgear. Prior to Anaheim, he was a project engineer for American Electric Power in Columbus, Ohio, U.S. Taghavi received BSEE and MSEE degrees from Ohio State University and is a registered professional engineer in California and Ohio. **JTaghavi@Anaheim.net**

Keith Tieszen is a project manager in System Planning for Anaheim Public Utilities. He has more than 40 years of experience as an electrical and consulting engineer for substation design and construction. He is author and developer of two GIS design-build bid packages, including Anaheim's Park Substation and a proposed GIS 69-kV/12-kV substation to be located inside a new building with a historical architectural theme. Tieszen has extensive experience in engineering, design, procurement, and specifications construction coordination and project management of substation projects. He holds a BSEE degree from California State Polytechnic University at Pomona, and did some graduate studies at the University of Southern California. **KTieszen@Anaheim.net**

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ANAHEIM
PUBLIC UTILITIES
www.anaheim.net

Above Ground 138kV Transmission Line
From New City / South Mtn. Road Area

Underground Transmission
Line Begins Here at Northern
Edge of New Square

Village of New Square

Underground Route of
Transmission Lines

99% of EMF Reduced within
25' of Underground Lines

Benefits of Underground Lines:

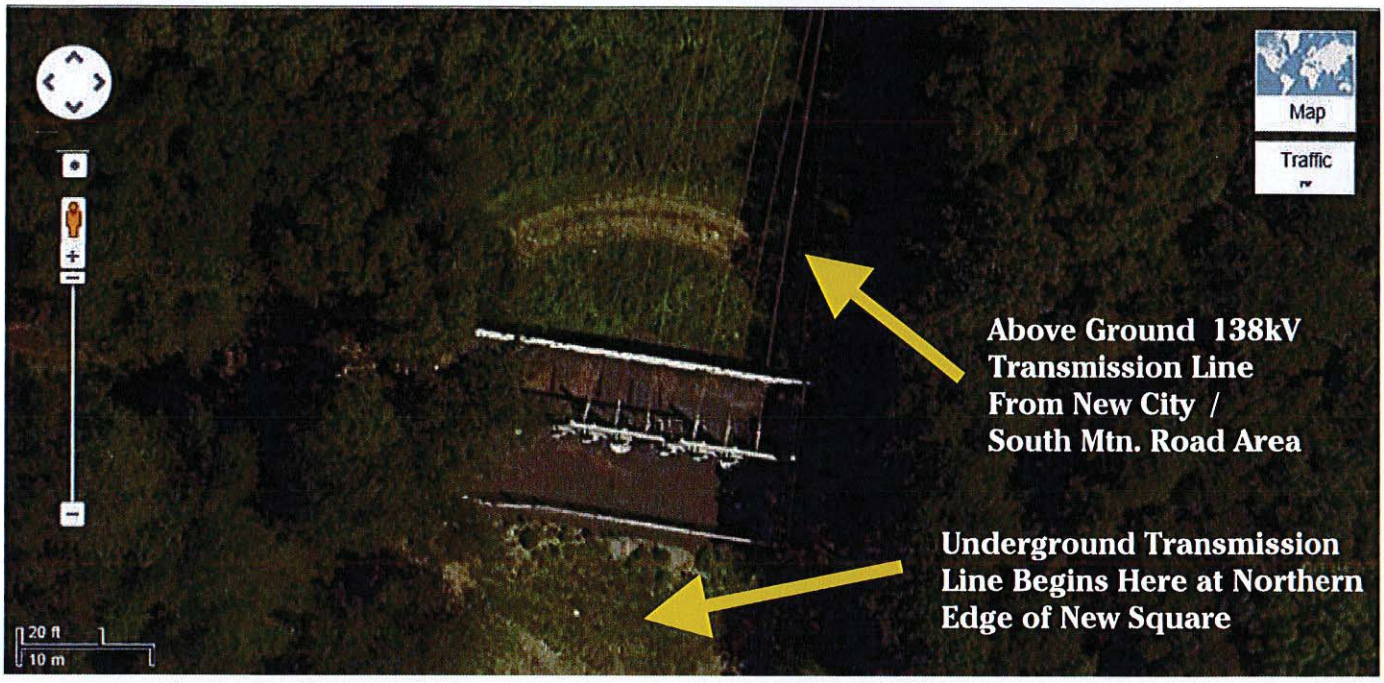
- **Reduced Risk of Childhood Leukemia & Other EMF Effects**
- **No Issues of Aesthetics**
- **No Impacts on Property Values**

Above Ground Transmission
Line Re-Emerges Here at
Southern Edge of New Square

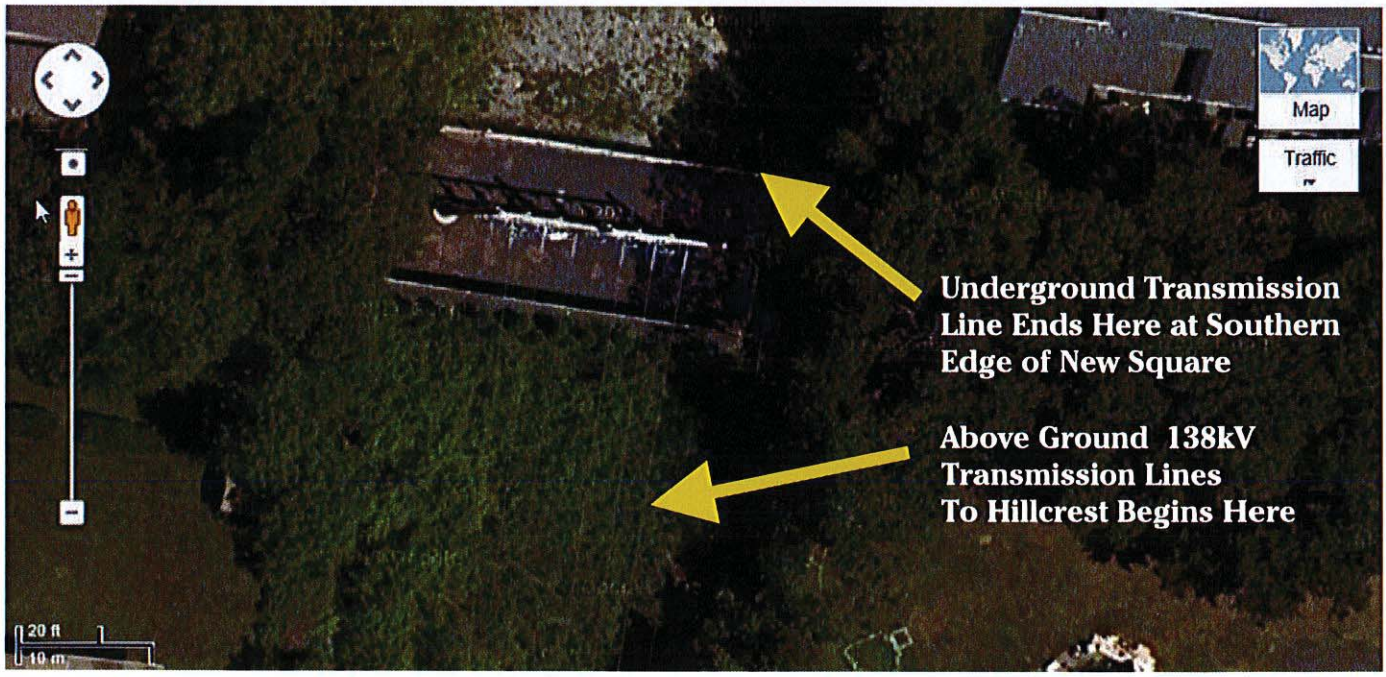
Presented June 6, 2012 to the Clarkstown Planning Board by Marvin Baum

Village of New Square
Underground Transmission Line Facilities

Satellite Image: North of Reagan Road / East of Clinton Lane



Satellite Image: South of Wilson Avenue / East of Washington Avenue



Presented to the Clarkstown Planning Board June 6, 2012 by Marvin Baum

Debbie Tretola

From: Marvin Baum [marvin@baumimagegroup.com]
Sent: Friday, June 22, 2012 11:07 AM
To: s.thormann@clarkstown.org
Cc: 'Jose Simoes'; 'Bob Geneslaw'; 'Shirley Lasker'; 'Martus Granirer'; 'Terri Thal'; 'Mark Gilliland'; 'Patricia Podolak'; 'Amy Kupferberg'; annejaffeholmes@me.com; christopher.crane@yahoo.com; 'Susan Porcino'; 'Walter Rodriguez'; 'Walker, Kirsten'; JHOL49@aol.com; Ed Day; 'Peter Vitro'; 'Bob McGloughlin'; Anthony Montalbano; a.mele@clarkstown.org; derfin@frontiernet.net
Subject: O&R Gas Line Explosion in Nyack: Answers Needed for New City Substation DEIS

Importance: High

Dear Ms. Thormann:

On June 14, 2012, I sent you a follow-up email that specifically addressed the potential dangers related to the proposed gas and electrical substations being co-located in New City. Here's what I said:

The first three attached documents talk about gas line explosions -- one massive deadly explosion in San Bruno, CA, in 2010, and ***one more recently on an O&R gas line in nearby West Haverstraw, which fortunately was not deadly because the homeowners weren't home at the time. The Haverstraw story demonstrates how easily something could (and did) go wrong because a utility contractor didn't follow proper procedures.*** *Given the inherent risks of explosion and fire that I've shown is possible at electrical substations (in my May presentation), the question needs to be answered by the DEIS about the cumulative risks of co-locating a gas regulator or gas substation at the same site, which could make the proposed project even more dangerous for the public's health and safety than each facility would do independently of the other.*

O&R's gas line explosion in Nyack has been all over the news today:

http://nyack.patch.com/articles/gas-line-explosion-towering-flames-greeted-nyack-firefighters#video-10407467

I particularly urge you to watch the video on Patch.

Unlike the Haverstraw explosion, which was caused by a Verizon subcontractor, this accident was caused **directly** by an O&R contractor. **My foretelling words to you last week were that this "story demonstrates how easily something could (and did) go wrong because a utility contractor didn't follow proper procedures,"** which is exactly what happened just hours ago in Nyack.

Once again, we were extremely lucky that no one was killed, but as I said to you in an email yesterday before this accident occurred: **"do we wish to rely on luck and 'wishful thinking,' as evidenced by the failure of the Applicant to adequately address health and safety issues in their DEIS?"**

The flames from the Nyack explosion went more than two stories into the air. I believe the gas line at South Mountain Road is larger than the gas line in Nyack, and therefore might have an even greater potential for the size of explosion and flame height. **Does Clarkstown really want to take this kind of risk to public safety in a heavily-wooded residential neighborhood where a fire could easily get out-of-control?**

Through the public hearings and my follow-up emails, I've now identified multiple safety-related problems experienced by the Applicant in the past 2 years:

1) Nyack Gas Line Explosion (June 2012)

2) Dumbo Substation Explosion & Fire (April 2012)
3) Pleasantville Substation Explosion, Fire and Brush Fire (April 2012)
4) West Haverstraw Gas Line Explosion (January 2012)
5) Haverstraw Substation Explosion & Fire (August 2011)
6) Yonkers Substation Explosion & Fire (June 2010)
7) Bronx River Oil Spill Resulting from Yonkers Substation Fire (November 2009)
8) Yonkers Substation Explosion & Fire (November 2009)

While the Applicant says it has learned from prior accidents, clearly there is no shortage of new problems and/or "lessons not learned" from prior "events."

In doing some research, I came across another proposed O&R electrical substation that was to be co-located with a gas line. I don't think that substation was ever built, and **one of the technical reports identified a specific risk of co-locating these facilities, beyond the various issues I have already raised** -- one that would need special equipment to minimize the chances of an "event" on the gas line and careful, ongoing monitoring to make sure that the electrical substation equipment doesn't cause a problem with the gas line (my main focus, thus far, has been on an explosion at the electrical substation causing a secondary -- and perhaps even larger -- explosion at the gas substation, however this other "problem" would not necessitate an explosion at the electrical substation to cause havoc on the gas line).

The O&R DEIS should identify **ALL** potential problems/risks resulting from co-location and should identify if these safety precautions are already in place for the temporary substation that is located just a few yards away from the existing gas line regulator.

The danger to the community of the segmented approvals of the temporary substation and permanent substation in New City are now even further highlighted by O&R's accident in Nyack. **As of today, I still have not received the various documents from Clarkstown (in response to my FOIL request) that were withheld from Mr. Granier's prior FOIL request. Mr. Maneri had one of those documents, a permit stating O&R could keep the temporary substation onsite until the new substation is built (which problematically assumes the proposed substation will be approved) at the June 6th meeting, so it's not an issue that the documents can't be found.** I fully expect that these withheld documents will be produced by Clarkstown, in accordance with the Freedom of Information Law.

Please distribute this email to all Planning Board members and make it part of the public record on the New City substation DEIS.

Thank you.

Sincerely,

Marvin Baum

d:/c

Town of Clarkstown

Rosalie Amicucci <r.amicucci@clarkstown.org>

PSC Issues Notice of Probable Violation for O&R in January Gas Line Explosion

1 message

Marvin Baum <marvin@baumimagegroup.com> Mon, Jul 30, 2012 at 9:29 AM
To: s.thormann@clarkstown.org, Jose Simoes <j.simoes@clarkstown.org>, Bob Geneslaw <rgeneslaw@aol.com>, Amy Mele <a_mele@town.clarkstown.ny.us>, Shirley Lasker <shirlasker@aol.com>
Cc: Rosalie Amicucci <r.amicucci@clarkstown.org>, JHOL49@aol.com, Martus Granirer <martus@granirer.us>, Terri Thal <thal.terri@gmail.com>, "Walker, Kirsten" <kwalker@enduranceservices.com>, Mark Gilliland <mg@markg.org>, Amy M Kupferberg <artgirl22@earthlink.net>, Patricia Podolak <patricia.podolak@verizon.net>, annejaffeholmes@me.com, Chris Crane <christopher.crane@yahoo.com>, sporcino@hotmail.com, Walter Rodriguez <WRodriguez@tasrc.com>, derfin@frontiernet.net

The PSC has now indicated that O&R might have played a role in the terrible West Haverstraw gas explosion that took place in January. Until this point, only a Verizon subcontractor was criminally charged in that case. I had written to the Planning Board in June about this gas explosion and had warned that another such incident could take place, which it did about one week later in Nyack.

Here are the news reports about the Verizon subcontractor considering a change in his plea, based on new information from the PSC:

http://newyork.newsday.com/rockland/contractor-in-w-haverstraw-gas-blast-withdraws-guilty-plea-1.3863567

http://www.news12.com/articleDetail.jsp?articleId=328501&position=1&news_type=news

If O&R is found culpable of negligence in this case, it would be a surprising turn of events that further highlights the dangers of allowing them to install electric and gas substations on a single site in a residential neighborhood.

Sincerely,

Marvin Baum

Debbie Tretola

From: Jose Simoes [j.simoes@clarkstown.org]
Sent: Friday, June 08, 2012 5:07 PM
To: Anthony Montalbano
Subject: Fwd: Information on PCB emissions from Substation Fires -- Safety Date Requested
Attachments: image002.jpg

---------- Forwarded message ----------
From: **Marvin Baum** <marvin@baumimagegroup.com>
Date: Fri, Jun 8, 2012 at 4:56 PM
Subject: RE: Information on PCB emissions from Substation Fires -- Safety Date Requested
To: s.thormann@clarkstown.org, j.simoes@clarkstown.org
Cc: Bob Geneslaw <rgeneslaw@aol.com>, Jose Simoes <j.simoes@clarkstown.org>, Shirley Lasker <shirlasker@aol.com>, Amy Mele <a_mele@town.clarkstown.ny.us>, Martus Granirer <martus@granirer.us>, Terri Thal <thal.terri@gmail.com>, Mark Gilliland <mg@markg.org>, artgirl22@earthlink.net, Patricia Podolak <vze27vte@verizon.net>, annejaffeholmes@me.com, Susan Porcino <sporcino@hotmail.com>, Walter Rodriguez <wrodriguez@tasrc.com>, JHOL49@aol.com, Rosalie Cautillo <r.cautillo@clarkstown.org>, Peter Vitro <pobrod46@aol.com>, Bob McGloughlin <litmc2@aol.com>, "Walker, Kirsten" <kwalker@enduranceservices.com>

Dear Ms. Thormann:

Ms. Walker raises a very important point I made at the first meeting on this subject in May. The substation DEIS only talks about onsite "mineral oil" in the transformers, which sounds like something safe enough to put on a baby. The implication is that the onsite materials for the substation will be absolutely safe under all conditions.

The reality, as I indicated, is that there are typically a number of toxins at substation facilities, including PCBs. I had specifically asked that the DEIS include a full list of all potential toxins, which could be emitted during normal and/or emergency conditions that could end up in the water and/or in the air. The DEIS should provide a material data sheet for each substance contained onsite that is potentially toxic in any form from any source (liquids, plastics, foams/rubber/insulators, oil containment substances, plated/coated metals, etc.).

Although I did bring it up at the May meeting, this subject was not addressed in the review of prior public input at the meeting on Wednesday. Therefore, I would like to reiterate my request and ask that you make this request part of the formal record. I believe the public is entitled to this information, especially since we're talking about a residential zone and that this property contains a source of our drinking water, and therefore should be contained in the DEIS.

Sincerely,

Marvin Baum

Baum Image Group, Inc.

(845) 353-3082

From: Walker, Kirsten [mailto:kwalker@enduranceservices.com]
Sent: Friday, June 08, 2012 1:59 PM
To: s.thormann@clarkstown.org; j.simoes@clarkstown.org
Cc: Bob Geneslaw; Jose Simoes; Shirley Lasker; Amy Mele; Martus Granirer; Terri Thal; Walker, Kirsten; 'Mark Gilliland'; artgirl22@earthlink.net; 'Patricia Podolak'; annejaffeholmes@me.com; 'Susan Porcino'; 'Walter Rodriguez'; JHOL49@aol.com; Rosalie Cautillo; Peter Vitro; Bob McGloughlin; marvin@baumimagegroup.com
Subject: Information on PCB emissions from Substation Fires

Dear Ms. Thormann, and Mr. Simoes,

I am attaching an article about the fire at the Dumbo substation in NYC. What we did not mention in the last meeting was the effects of the actual fire. This point has gone largely unquestioned. We have studied the effect of the potential for leaks with the substation and the containment of those substances. This article speaks to the fire releasing PCBs – a known carcinogen into the AIR, that even three days after the fire, were still at unacceptable levels. Con Ed was slow to release the report, and slow or negligent about any resulting property damage. As a home owner, I need to know what effect the release of massive amounts of PCBs would do to my home, my child, and to my real estate value. Additionally, I want to know what Con Ed would do to address an airborne contaminant. My assumption based on this article – is that they would not do much. Considering that most of these concerns are alleviated by putting systems underground, including the surrounding lines, I am not sure why this is not the protocol given the potential environmental hazards. It certainly is the protocol in other countries.

http://dumbonyc.com/2012/05/14/coned-substation-explosion-collateral-damage/

I am also sending along information on PCBs to put this in perspective.

http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/about.htm

I had the great misfortune of living in downtown Manhattan during 9/11. The air was heavy with toxic smoke well after the fires had subsided. I have friends who worked in the relief efforts, and are paying the price now with their health. Being in the aftermath of a toxic hazardous fire, is not a situation I want to repeat.

I realize that this concern is over a "what if" scenario, but the problem is that these fires are quite common. They have been caused by lightning strikes, snakes in the area (which are abundant), and other animal interference. Since I moved to South Mountain Road, I have personally witnessed 4 lightning strikes on my property, and have had 6 stricken trees removed. My point here is that excessive lightning is not a rare event in this wooded area. The method of reducing interference through an electrified fence is also problematic. I have a 2 year old rambunctious boy. If he makes it across the street and touches an electrified fence, what will Con Ed do for me? Surely they don't expect that a child his age would be able to read or comprehend the warning sign. Two weekends ago, he wandered out of the house and after 10 minutes of frantically searching for him, I found him by the little bridge in my front yard. He woke up from a nap, and went looking for me. At a minimum, it is up to Con Ed to provide a suitable barrier for my property as well.

Many experts spoke about the safety of background EMF. I don't disagree that background EMF is less dangerous, but they spoke to the permanent location of the substation. They spoke to when the substation would be firmly planted in the middle of the property. For now, it is not in the middle of the 10 acre lot. It is right on South Mountain Road – and is analogous to standing us in front of a microwave for 24 hours a day. The experts questioned only examined the proposed scenario, not the immediate scenario. Even background EMF, has an effect. The article I mentioned before studied the effect of EMF in African American Women and what they used as the low grade source was an electrical blanket.

There are also a number of articles which turn my conjecture about the effects of EMF on autism, into fact. It isn't just harmful in its role as a contributing factor of autism, it also slows any improvement and development.

http://www.earthcalm.com/5431/emfs-and-health/emf-radiation-cause-of-autism/

While we are not debating the significant demolition of the trees in the right of way that Con Ed is undertaking simultaneously on my property, I do feel that it's particularly unjust to have one house as the apex of all of this destruction. Yes, it's one house, but it's MY house. The trees in the right of way offer a barrier to the EMF caused by the power lines, and the erosion and excessive storms have wiped out the barrier of trees on the south end of the property facing the substation. In essence, my house has become a radioactive disaster. At a minimum, it should be up to Con Ed to measure the levels of EMF on everyone's perimeter boarders, and rectify any overages in acceptable levels of EMF.

I also want to mention that I did hear back from the assessment board who decided that the value of my house was decreased 10% (Though I believe that it's more like a 40% decrease). I don't know what tax adjustment is made because of that, but I believe that it should be significant. I believe that the value of my house is at about half of the purchase price. That means that I can't refinance my mortgage, and take advantage of lower mortgage rates. Which, as someone with very good credit, costs me about $650 per month. The value of my house is lower than the mortgage that is left on it. That's not because of the economy, that's because of Con Ed. Why aren't I being compensated for that? In fact why isn't everyone on South Mountain Road being compensated? If that is the demand, from all of the residents on South Mountain Road, doesn't it become more economically advantageous for Con Ed to bury the lines, and the substation?

I do expect that this will be a matter of public record, and I thank you for your time.

Best Regards,

Kirsten Walker

This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify the system manager. This message contains confidential information and is intended only for the individual named. If you are not the named addressee you should not disseminate, distribute or copy this e-mail.

~!~

June 13, 2012

Dear Ms. Thormann:

I am unable to attend tonight's meeting on the proposed substation in New City. Due to time limitations at the meeting last week, I did not have a chance to finish my presentation and raise a number of additional critical questions that need to be answered in the DEIS.

Therefore, I ask that you read the following into the record for the benefit of the public:

1. The proposed substation site already has a cellular communications tower from Verizon. The potential health effects of cell towers remains controversial and long-term exposure impacts are unknown, but the Town of Clarkstown has implemented regulations that take a "prudent avoidance" approach to placement of these facilities in residential neighborhoods, near schools and other areas where young children would spend significant time. Given the existing EMFs generated by the existing high voltage transmission lines and the provided data suggesting potential health impacts of EMFs on children (i.e. the Oxford University study), the DEIS should provide data about the "cumulative risks" of a cell tower, transmission lines and the proposed substation.

2. Given the health risk information that I've provided on EMF exposure, the Town of Clarkstown should retain consultants with technical and medical expertise to better understand the risks associated with the combination of the existing transmission lines and cell tower with the proposed new substation. I can provide the Town with a list of potential expert consultants; however I've been told that David Carpenter of the University at Albany is a top expert in this field and would potentially be a very appropriate choice (http://www.albany.edu/news/experts/8212.php). I would also recommend Dr. Gerald Draper of the Oxford Study, although he is now retired, so I don't know if he is still doing consulting work. Dr. Carl Baum (no relation) of the Yale School of Medicine is available, too.

3. The DEIS has a very limited exploration of the potential impact of electrical substations on the value of neighboring residential properties. It does not explore the combined impact of an electrical substation and related overhead transmission lines plus a gas substation and related gas lines plus a cell tower and related facilities. The DEIS should provide information on similar electrical substations in

residential neighborhoods around the U.S. that are co-located with gas substations and cellular towers since these facilities collectively create more risks. Projected property value impacts should only be determined using these locations only, not by using stand-alone electrical substation facilities.

4. The DEIS should provide data about the current EMF levels along the transmission lines between the two neighboring Haverstraw substations and the Pascack Road substation in Spring Valley. With the addition of the substation at South Mountain Road and the increased usage (for instance with the switch of Tilcon's dedicated transformer from Haverstraw to New City), will the EMF levels along the transmission lines increase (usage levels of transmission lines do impact EMF levels and a lower-powered transmission line can actually have more EMF than a high-powered transmission line)?

5. Why does O&R plan to move Tilcon's dedicated transformer from Haverstraw to New City? Please describe in detail and give all information on how the 20MVA transformer will be connected between the substation and the facility. The DEIS should have peak load data (at startup) for Tilcon, not just standard load data.

6. United Water is planning a controversial desalination plant in Haverstraw. The desalination, filtration and pumping process will require a massive amount of electricity. Which substation or substations will be providing that power? Will United Water need dedicated transformers or a new substation and, if so, where will those facilities be placed? Does the move of the Tilcon transformer have anything to do with the O&R being able to meet the needs of United Water?

7. Currently, the Haverstraw substation provides electricity to northern New City, yet there is no indication in the DEIS that the New City substation will be providing service coverage or backup to Haverstraw. Why not? Won't this become more important if the desalination plant comes online?

8. If the United Water project is approved, is it possible that the New City substation will need to be expanded? Will the Applicant guarantee that this substation will never be expanded beyond the current proposed substation, as it has already done elsewhere?

9. The former President of O&R, John McMahon, stated at an annual meeting in 2008 his company's "plan" to build 21 substations and modify/upgrade others. Are there any plans to add, upgrade or modify any substations that directly or indirectly connect to the proposed New City substation including the Haverstraw

substations, New Hempstead substation, the Pascack Road substation, the Congers substation and the Route 59 West Nyack substation?

10. The Applicant gives very limited alternatives in the DEIS. The DEIS should include:
    a. Plans for placing the substation and related transmission lines underground.
    b. Plans for alternate locations like the Tilcon quarry in Haverstraw and at the Burts Road industrial park in northern New City.
    c. Plans for meeting New City's future electrical needs using clean, locally-generated solar electricity.

11. New Jersey has installed more solar panels in the first two months of 2012 than New York State has done in its entire history. In PSE&G's service territory, solar panels will be generating 80 megawatts of power. 40 megawatts will come from solar panels placed on existing utility poles and 40 megawatts will come from centralized locations (http://www.pseg.com/family/pseandg/solar4all/index.jsp). Clarkstown is already considering using the former landfill in West Nyack for the installation of a solar farm, and the State of New York is considering the bi-partisan "Solar Jobs Act" to significantly increase the generation of solar power for our grid. The Applicant's existing DEIS proposes to perpetuate the current antiquated system. It should explore forward-thinking alternatives, as well as ways to reduce current energy usage/growth in northern New City, such as switching to LED street lights.

12. The DEIS should provide actual usage data for northern New City and projections for future use. Residential and commercial growth in the area has slowed, especially after the economic downturn of 2008, and the Town is now virtually built-out. Government employees are being reduced. Everyone is going "green" with lower wattage light bulbs, appliances, heating & air conditioning systems, etc. Today's big LED TVs and computers use significantly less electricity than older devices. The usage data is needed to evaluate the needs of northern New City and to understand if other factors, like the proposed water treatment plant in Haverstraw, are the underlying need for the proposed substation. If so, this might raise additional questions about segmentation.

13. How can O&R ensure that employee or contractor errors, like what happened with the massive gas explosion earlier this year in Haverstraw, won't happen at this facility?

I will be separately be submitting a variety of supporting documentation in an email to the Planning Board.

Thank you very much.

Sincerely,

Marvin Baum
Valley Cottage, NY.

Town of Clarkstown

Jose Simoes <j.simoes@clarkstown.org>

O&R DEIS Issue

2 messages

Marvin Baum <marvin@baumimagegroup.com> Thu, Jun 14, 2012 at 5:19 PM
To: s.thormann@clarkstown.org
Cc: Jose Simoes <j.simoes@clarkstown.org>, Shirley Lasker <shirlasker@aol.com>, a.mele@clarkstown.org, Bob Geneslaw <rgeneslaw@aol.com>, Martus Granirer <martus@granirer.us>, Terri Thal <thal.terri@gmail.com>, Mark Gilliland <mg@markg.org>, Patricia Podolak <patricia.podolak@verizon.net>, artgirl22@earthlink.net, annejaffeholmes@me.com, christopher.crane@yahoo.com, Susan Porcino <sporcino@hotmail.com>, Walter Rodriguez <wrodriguez@tasrc.com>, "Walker, Kirsten" <kwalker@enduranceservices.com>, JHOL49@aol.com, Anthony Montalbano <am@mcfnylaw.com>

Dear Ms. Thormann:

O&R just received a multi-year rate increase from the PSC to pay for, among other things, the upgrade of their transmission and distribution systems:

http://nanuet.patch.com/articles/state-oks-o-r-rate-hike?ncid=newsltuspatc00000003

Without even reading the details of the Rate Case submitted to the PSC by O&R, I'd be fairly certain that taxes on transmission and distribution systems would be covered by this and/or future rate increases.

In several areas of the DEIS, O&R indicates that, if approved, the proposed substation will "benefit" Town of Clarkstown and the local school district from increased property taxes generated, but they don't identify exactly who will be funding these taxes.

If my understanding is correct, the people funding the taxes will be O&R's ratepayers... the same people who pay local taxes. The payment of these taxes will drive up the overall cost of living in Clarkstown, offsetting the benefit that is being touted in the DEIS.

Therefore, the DEIS should, at each discussion of the tax revenue generated, identify the source of funding for these increased taxes (i.e. through rate increases imposed upon ratepayers by the PSC).

Please include this email and my request as part of the official record.

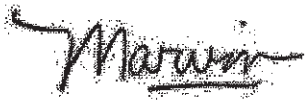
Thank you.

Sincerely,

Marvin Baum

Jose Simoes <j.simoes@clarkstown.org> Fri, Jun 15, 2012 at 9:08 AM
To: Anthony Montalbano <am@mcfnylaw.com>

[Quoted text hidden]



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COUNTY OF ROCKLAND
DEPARTMENT OF HIGHWAYS
23 New Hempstead Road
New City, New York 10956
(845) 638-5060
Fax. (845) 638-5037

C. SCOTT VANDERHOEF
County Executive

CHARLES H. VEZZETTI
Superintendent of Highways

May 5, 2011

From: Joe Pyzowski

To: Attendees

Re: Utility Pole Coordination Field Meeting - May 3, 2011

The following attendees walked the site to confirm utility pole locations and discuss and resolve conflicts with existing and proposed road features and improvements. Those in attendance were:

John Cirillo.....Lewis Tree Service
Mike Gorse.....Orange & Rockland Utilities
Patrick McGrath.....Montesano Bros.
Walter Greening.....HVEA
Steve Scarpulla.....HVEA
Joseph Pyzowski.....Rockland County Highway Dept.

The following was resolved:

Division of tree clearing/trimming between O&R Contractor (Lewis) and County Contractor (Montesano Bros.) was clarified.

Generally property owners will be given the option of either having "enhanced trimming" by O&R contractors performed on trees, or having the trees removed. Lewis will cut stumps as close as possible to the ground surface.

O&R will provide a listing of trees which are "approved" for planting under aerial wires. The County will add trees, where necessary, to replace those removed as part of the road contract, or those removed by O&R for line clearing. As discussed at the subject field meeting additional plantings may be required:

- Between Sta. 4+140 and Sta. 4+210 (Lt.)
- Starostiak property (NE corner of New Hempstead and Little Tor Roads)

Ms. Starostiak tentatively agreed to have 2 large trees removed by O&R. Lewis will verify prior to removal.

The County will get back to O&R regarding service needs and location for the Parks Dept. Building (adjacent to Clerk's Building, which will be removed). *Response- subsequent to the meeting it was determined that service should be provided utilizing the existing pole line located immediately west of the Highway Department Building (23 New Hempstead Road). This will require removal and replacement of the first pole (nearest New Hempstead Road).*

Poles at Sta. 3+730 +/- and Sta. 3+760 +/- (LT.) were evaluated for location adjustment to better coordinate with road construction and to maintain customer service

Poles at LTR Sta. 1+280 +/- and Sta. 1+250 +/- (LT.) will be evaluated for location adjustment to better coordinate with road construction and to reduce impact to adjacent private property

Guy pole at Sta. 3+800 +/- (RT.) will be moved to reduce impact to exiting trees at the Demarest Kill Park. It was agreed that Lewis will remove a smaller Pin Oak to minimize impact to an adjacent larger Oak; the County will coordinate with Parks Dept.

Survey and stakeout of proposed sidewalk, walls, etc. is critical prior to placement of poles at the following locations:

- Guy Pole Sta. 3+800 +/- (RT.)
- Guy Pole Sta. 3+880 +/- (RT.)
- Pole Sta. 3+850 +/- (LT.)
- Pole Sta. 3+760 +/- (LT.)
- Pole Sta. 3+690 +/- (LT.)
- Pole Sta. 3+650 +/- (LT.)
- Pole Sta. 3+660 +/- (LT.)
- Pole Sta. 3+600 +/- (LT.)
- Pole Sta. 3+510 +/- (LT.)

Next meeting has been rescheduled for Tuesday May 10th at 8:30. We will meet just west of Little Tor Road.

C: File 3273

Sells ◆ PB
Joint Venture
One Penn Plaza
New York, NY 10119
212.465.5000

New Hempstead Road Corridor Safety Study

Palisades Interstate Parkway to NYS 304
PIN 8755.23, RC 3273 (PB 26533)
August 28, 2003, 8:30 AM
Rockland County Highway Department

MEETING AGENDA
UTILITY ISSUES

1. Project Overview
    a. Limits
    b. Scope of work
    c. Schedule
2. Downtown Section of Project
    a. Little Tor Road to Main Street
    b. Underground Installations
3. Rural Section of Project
    a. Palisades Interstate Parkway to Little Tor Road
    b. Aerial installations
    c. Location of poles and conflicts with retaining walls – Phillips Hill Road

Sells ◆ PB
Joint Venture
555 Pleasantville Road
Briarcliff Manor, New York 10510
914.747.1120

DRAFT MEETING MINUTES

Date: June 30, 2009

Time: 9:00 A.M.

Place: Rockland County Highway Department
23 New Hempstead Road
New City, NY 10956

Project: New Hempstead Road Reconstruction
Palisades Parkway to Route 304
PIN 8755.23, RC3273 (PB 26533, Sells 01007)

Purpose: Utility Meeting

Attendance:
Nancy Willen.....Clarkstown Highway Dept. - 845-623-7500
Luke Kalarickal.....Clarkstown DEC – 845-639-2111
Joseph Lafiandra.....RCSD #1 – 845-365-6111
Jim Tannhauser.....O&R Electric – 845-577-3201
John Ryan.....O&R Electric – 845-577-3147
Dennis Haney.....Cablevision – 845-986-0221 (ext. 248)
Steven Lewis.....O&R Electric – 845-577-8612
Anthony Rainone.....O&R Electric – 845-577-3028
Ryan Attianese.....O&R Gas – 845-577-3283
Fred Clark.....O&R Gas – 845-577-3305
Albert Lee.....Verizon – 914-741-7227
Edgar Otamias.....Verizon – 914-741-7227
Michael Piemontesi.....BS&J (United Water) – 201-767-3111 (ext. 109)
Tim Hurley.....WSP Sells – 914-747-1120
Bernie Kalas.....WSP Sells – 914-747-1120
Joseph Pyzowski.....RCHD – 845-638-5060

Meeting Discussion:

1. The project status was reviewed. Contract letting is planned for late 2009, with a start of work in Spring 2010. Work would span 2 construction seasons.

2. O&R indicated that a substation project at Little Tor Road is currently scheduled for Fall 2010. Therefore, the preference is to work in the area east of Little Tor Road first until the substation work is complete.

3. Draft utility work agreements were distributed for electric, gas, water, telephone and television companies. The agreements list the proposed utility replacements shown in the

Sells ◆ PB
Joint Venture
555 Pleasantville Road
Briarcliff Manor, New York 10510
914.747.1120

plans. **Utility companies should provide their comments to the County (via email to Tim Hurley) by July 31, 2009.** Comments should address locations where replacements may not be needed, additional locations where they are needed, notice requirements, time restrictions, staging and construction sequence requirements, etc.

4. SELLS/PB will email everyone in attendance pdf files containing the drainage and utility plans, traffic control plans, and profiles. Boring logs and Microstation files are also available by request. O&R Gas and United Water (BS&J) have requested the Microstation profile drawings.

5. Water lines should be 10' from sanitary sewer lines whenever possible. Any temporary water main shutdowns (more than just transitions to new main) should be planned for outside of June, July, and August.

6. The basic traffic control plan was reviewed. The phasing at the S-curve would include lowering the North side first, with new utility lines installed. The existing utility lines can then be removed and the south side of the roadway constructed. **Utility companies should provide their comments on traffic control to the County (via email to Tim Hurley) by July 31, 2009.**

7. Utilities must inform the County of the work they wish to have included in the County's construction contract. Shares will be developed for each utility. Detailed design drawings, Construction Details and specifications must be provided. **Utility companies should indicate their intention to include or not to include their company's work in the County's Construction contract (via email to Tim Hurley) by July 31, 2009. Companies that elect to have their work performed under the County's construction contract must provide final construction documents (to Tim Hurley), for inclusion in the bid package, by September 31, 2009.** ~~**provide their details and specifications for work to be included to the County (via email to Tim Hurley) by July 31, 2009.**~~

8. Utilities are encouraged to have their own inspectors on site while the work is performed. Required notice of various operations should be included in comments on the draft utility work agreements.

Cc: All attendees

Sells ◆ PB
Joint Venture
One Penn Plaza
New York, NY 10119
212.465.5000

MEETING MINUTES

Date: August 28, 2003

Time: 8:30 A.M.

Place: Rockland County Highway Department
23 New Hempstead Road
New City, NY 10956

Project: New Hempstead Road Corridor Safety Study:
Palisades Parkway to Route 304
PIN 8755.23, RC3273 (PB 26533)

Purpose: Utility Meeting

Attendance:

Joseph Pyzowski	Rockland County Highway	845-638-5060
Steven Smith	Sells/PB Joint Venture	914-747-1120
Jared Anderson	Sells/PB Joint Venture	914-747-1120
Bernie Kalus	Sells/PB Joint Venture	914-747-1120
George Moglia	Sells/PB Joint Venture	212-465-5778
Kevin LaGreca	Sells/PB Joint Venture	212-631-3859
James Evangelisti	Verizon Engineering	914-741-7760
Ben Hemus	Verizon Engineering	914-741-8746
James Tannhauser	Orange and Rockland	845-577-3201
Tom Chase	Cablevision	845-624-3500 (x293)

Documents Exchanged at Meeting:

1. The Consultant provided the County with copies of the In-Progress preliminary plans which included profiles and typical sections.

2. The Consultant provided the utility companies with typical sections showing utility pole relocation.

Meeting Purpose

A. To provide utility owners with early insight into project impacts and initiate utility relocation/accommodation process.

B. To avoid delays experienced during the North Main Street project by increasing the involvement and coordination with the utility owners.

Meeting Discussion (see attached Agenda):

1. Joe Pyzowski, P.E., Project Manager of the Rockland County Highway Department stated that a project objective is to provide aesthetic improvements in the "downtown area" on New Hempstead Road between Little Tor Road and North Main Street. These improvements will include landscaping, pedestrian treatments, ornamental street lamps, etc. Associated with these aesthetic improvements the County and the project's Citizens Advisory Group are requesting that utility owners investigate reconstructing aerial facilities between the Sheriff's Department and North Main Street, underground. Additionally, significant aerial relocation will be required within the remaining project area west of Little Tor Road to the Palisades Interstate Parkway.

2. Bernie Kalus of the Sells/PB Joint Venture gave an overview of the project for the utility companies. Mr. Kalus explained that the intent of the project was to perform full depth reconstruction with widening throughout the New Hempstead Road corridor and perform profile readjustments at Phillips Hill Road, the 'S-Curve' and for the bridge over Demarest Kill near North Main Street. Mr. Kalus also described the proposed intersection improvements at Little Tor Road and North Main Street and the aesthetic enhancements in the Downtown Section (Little Tor Road to North Main Street).

3. The following summarizes the discussions and conclusions reached with the utility company representatives.

- Utility company representatives felt that utility pole relocations are of concern depending on the limits of sidewalk installation, given the need for pole clearance to roadway edges and trees, and the limited right-of-way that is available.

- Funding for utility relocation work was brought up by Verizon. It was questioned whether or not the County would be paying for both the underground installations and overhead relocation of lines. The County stated that the additional cost associated with installing facilities underground in the downtown area would be reimbursed to the utility companies. In other words between Little Tor Road and North Main Street the companies would be responsible for the costs that would have been incurred to adjust the aerial facilities to a new above ground location but would be reimbursed for incremental cost increases to reconstruct underground. The costs for all other relocations made necessary by the project are the responsibility of the utility owners.

- Verizon had noted that a pole will need to be placed on each side of the underground utility run in order to connect to the aerial utilities.

- It was noted that with the anticipated need for retaining walls with safety barriers, the area of Phillips Hill Road would be of concern for pole relocations. As such, underground relocation in this area may be necessary. Mr. James Tannhauser of Orange and Rockland stated that three electric circuits run through this area and it would not be

possible to relocate that underground. Orange and Rockland will determine the extent of where the three circuits are located and will report back to the County.

- Utility companies requested plans showing existing poles with pole numbers (Verizon and O&R). The pole numbers for each pole is different for both Verizon and O&R, and both will be shown on the plans. Pole numbers would be obtained in an upcoming field survey by Sells/PB and added to the basemaps. It was noted by Mr. Kalus that ROW lines on the plans are as tight as possible, but still approximated to within a foot. Mr. Smith of Sells/PB also confirmed and stated that in areas of question, additional survey would be performed to verify and tighten the ROW line.

- Utility companies agreed that for preliminary design purposes, a pole should be at least 4 feet off the edge of pavement (shoulder). Consideration should also be given to the area at the top of the pole. About 4 to 5 feet on each side is required for clearance from trees to utility lines. This raised a question about tree trimming. Verizon prefers that the County perform the tree trimming.

- The plans to be sent to utility companies would also locate trees that are within a 4-5 feet of the edge of proposed shoulder. A potential "pole-line" will be created on these plans and reviewed in the field with the utility companies. Mr. Tanhausser described O&R's pole number as having 5 digit X and 5 digit Y coordinates. Mr. James Evangelisti of Verizon described their pole numbering as a W or P and a number to follow.

- All work associated with underground electrical service connections are typically included in the roadway contract. Provisions for telephone and CATV must be discussed.

- Plans are to be sent to Mr. Hemus of Verizon and Mr. Tannhauser of O&R.

- MPT is a concern particularly due to full depth reconstruction. It is desirable to have utilities perform their work prior to roadway construction to take full advantage of shifting traffic to the shoulder areas.

- Mr. Tannhauser stated that O&R can not relocate a circuit between June and September. Ideally they would need to finish before June.

- It was felt that utility companies should be involved in the bi-monthly progress meetings held by the County. The utility companies agreed and will be invited to future meetings.

- Some other issues to consider when going underground with utilities are switches, pad mounted transformers and their visual impact, and meeting the minimum distance to necessitate an underground relocation. It was suggested that landscaping around switches and transformers can facilitate a positive visual impact.

- Plans being sent to the utility companies should have the desired area of underground utilities marked up.

- To simplify coordination, the utility companies were requested to consider including their trenching and conduit work under the road reconstruction contract. Cable pulling would be performed by the utility companies.

Draft Minutes of Meeting Prepared by Sells/PB Joint Venture

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New York, NY 10119
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New Hempstead Road Corridor Safety Study

Palisades Interstate Parkway to NYS 304
PIN 8755.23, RC 3273 (PB 26533)
August 28, 2003, 8:30 AM
Rockland County Highway Department

MEETING AGENDA
UTILITY ISSUES

1. Project Overview
    a. Limits
    b. Scope of work
    c. Schedule
2. Downtown Section of Project
    a. Little Tor Road to Main Street
    b. Underground Installations
3. Rural Section of Project
    a. Palisades Interstate Parkway to Little Tor Road
    b. Aerial Installations
    c. Location of poles and conflicts with retaining walls – Phillips Hill Road

COUNTY OF ROCKLAND
DEPARTMENT OF HIGHWAYS
23 New Hempstead Road
New City, New York 10956
(845) 638-5060
Fax: (845) 638-5037

C. SCOTT VANDERHOEF
County Executive

CHARLES H. VEZZETTI
Superintendent of Highways

May 5, 2011

From: Joe Pyzowski

To: Attendees

Re: Utility Pole Coordination Field Meeting - May 3, 2011

The following attendees walked the site to confirm utility pole locations and discuss and resolve conflicts with existing and proposed road features and improvements. Those in attendance were:

John Cirillo.....Lewis Tree Service
Mike Gorse.....Orange & Rockland Utilities
Patrick McGrath.....Montesano Bros.
Walter Greening.....HVEA
Steve Scarpulla.....HVEA
Joseph Pyzowski.....Rockland County Highway Dept.

The following was resolved:

Division of tree clearing/trimming between O&R Contractor (Lewis) and County Contractor (Montesano Bros.) was clarified.

Generally property owners will be given the option of either having "enhanced trimming" by O&R contractors performed on trees, or having the trees removed. Lewis will cut stumps as close as possible to the ground surface.

O&R will provide a listing of trees which are "approved" for planting under aerial wires. The County will add trees, where necessary, to replace those removed as part of the road contract, or those removed by O&R for line clearing. As discussed at the subject field meeting additional plantings may be required:

- Between Sta. 4+140 and Sta. 4+210 (Lt.)
- Starostiak property (NE corner of New Hempstead and Little Tor Roads)

Ms. Starostiak tentatively agreed to have 2 large trees removed by O&R. Lewis will verify prior to removal.

The County will get back to O&R regarding service needs and location for the Parks Dept. Building (adjacent to Clerk's Building, which will be removed). *Response- subsequent to the meeting it was determined that service should be provided utilizing the existing pole line located immediately west of the Highway Department Building (23 New Hempstead Road). This will require removal and replacement of the first pole (nearest New Hempstead Road).*

Poles at Sta. 3+730 +/- and Sta. 3+760 +/- (LT.) were evaluated for location adjustment to better coordinate with road construction and to maintain customer service

Poles at LTR Sta. 1+280 +/- and Sta. 1+250 +/- (LT.) will be evaluated for location adjustment to better coordinate with road construction and to reduce impact to adjacent private property

Guy pole at Sta. 3+800 +/- (RT.) will be moved to reduce impact to exiting trees at the Demarest Kill Park. It was agreed that Lewis will remove a smaller Pin Oak to minimize impact to an adjacent larger Oak; the County will coordinate with Parks Dept.

Survey and stakeout of proposed sidewalk, walls, etc. is critical prior to placement of poles at the following locations:

- Guy Pole Sta. 3+800 +/- (RT.)
- Guy Pole Sta. 3+880 +/- (RT.)
- Pole Sta. 3+850 +/- (LT.)
- Pole Sta. 3+760 +/- (LT.)
- Pole Sta. 3+690 +/- (LT.)
- Pole Sta. 3+650 +/- (LT.)
- Pole Sta. 3+660 +/- (LT.)
- Pole Sta. 3+600 +/- (LT.)
- Pole Sta. 3+510 +/- (LT.)

Next meeting has been rescheduled for Tuesday May 10th at 8:30. We will meet just west of Little Tor Road.

C: File 3273

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Joint Venture
One Penn Plaza
New York, NY 10119
212.465.5362

MEETING MINUTES

Date: December 15, 2003

Time: 10:00A.M.

Place: Rockland County Highway Department
23 New Hempstead Road
New City, NY 10956

Project: New Hempstead Road Corridor Safety Study:
Palisades Parkway to Route 304
PIN 8755.23, RC3273 (PB 26533)

Purpose: Utility Meeting

Attendance:

Joseph Pyzowski	Rockland County Highway	845-638-5060
Kok Meng Png	Rockland County Highway	845-638-5060
John Rapetti	Sells/PB Joint Venture	914-747-1120
Jared Anderson	Sells/PB Joint Venture	914-747-1120
Bernie Kalus	Sells/PB Joint Venture	914-747-1120
Kevin LaGreca	Sells/PB Joint Venture	212-631-3859
Thomas McArdle	Verizon Engineering	914-741-8740
Shirlee Mclero	Verizon Engineering	914-241-8371
James Tannhauser	Orange and Rockland	845-577-3201
Brendan Sullivan	Orange and Rockland	845-577-3651
Patrick Wenz	Cablevision	845-624-3500 (x212)

Documents Exchanged at Meeting:

1. There were no documents exchanged at the meeting. Kevin LaGreca of the Sells/PB Joint Venture (Consultant) intends to mail a package to each utility agency. The package will include the maintenance and protection of traffic drawings presented within the meeting.

Meeting Discussion (see attached Agenda):

1. Bernie Kalus of the Sells/PB Joint Venture (Consultant) provided a general overview of the project's progress. He stated that the utility relocation in conjunction with the proposed maintenance and protection of traffic work is the key aspect to ensure the project schedule is maintained. The project intends to relocate the overhead utilities to underground between Little Tor Road and Main Street. The project team members discussed the open issue log developed at the last utility meeting.

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2. Joe Pyzowski from Rockland County mentioned that the purpose of these utility meetings is to coordinate the New Hempstead Road construction and scheduling needs of both the utility agencies and Rockland County. The recent North Main Street Improvements project experienced problems related to utility relocations which we do not wish to repeat It is expected that this coordination will facilitate the maintenance of the overall project schedule, which would prove to be a benefit to all.

3. The following summarizes the discussions and conclusions for each open issue log:

   Item 0001

   - Joe Pyzowski explained that the cost for relocating utilities on county right-of-way as a result of the New Hempstead Road Project is the responsibility of the utility agencies. Federally funded projects in New York State do not reimburse utility agencies for utility relocation work.

   - Joe Pyzowski requested that the utility agencies prepare cost estimates for relocating the utilities on New Hempstead Road between Little Tor Road and Main Street. The estimates would contain the cost that would have been incurred to adjust the aerial utilities above ground and the cost difference to replace the aerial facilities with underground. The Consultant will provide the cost for excavation and conduit installation, which could be added to the County construction contract. The completion of the cost estimate is essential for the next meeting scheduled in February 2004.

   - Rockland County will pay for the differential cost of relocating utilities underground on New Hempstead Road between Little Tor Road and Main Street.

   - Jim Tannhauser from O&R noted that service to homes and businesses are difficult to construct when utilities are underground. Joe Pyzowski noted that the County would pay for the reconstruction of secondary service connections to properties on New Hempstead Road between Little Tor Road and Main Street. Most of the properties within this area include the Rockland County Facilities. Joe Pyzowski also noted that it is allowable to construct transformers on Rockland County property if necessary, and further coordination is required regarding designating appropriate locations.

   - Installation of utility equipment on poles with ornamental features, as opposed to wooden poles, is not recommended.

   - Jim Tannhauser noted that a distance of 1,500ft is usually required to justify installing utilities underground, a length that is satisfied on New Hempstead Road between Little Tor Road and Main Street.

Item 0002

- Bernie Kalus presented a possible construction staging scenario for the proposed work within the Phillips Hill area between Phillips Hill Road and Colonial Drive. The proposed work includes the construction of parapet walls on both sides of New Hempstead Road, with the addition of temporary pavement on the north side with steel sheet piles for embankment support. The staging would require the utility poles to be relocated behind the steel sheet piles. The staging scheme shows the possible locations for the relocated utility poles. Copies of the drawings showing the staging scheme will be sent to the utility agencies.

- Jim Tannhauser noted that the there is triple circuit from the Palisades Interstate Parkway to John Street. He also noted that relocating a triple circuit underground is not preferred.

- Joe Pyzowski noted that the option exists to attach the relocated utilities to the proposed parapet wall.

- The utility agencies noted that it is easier to relocate poles in one long stretch, incorporating the entire New Hempstead Road corridor as opposed to relocating poles in sections which would minimize the total number of splices required.

- The relocation of overhead utility lines will not be restricted by the installation of steel sheet piles because the piles will be cut close to grade.

- Bernie Kalus asked the utility agencies if there are any specific general provisions required for relocating utilities because the Contractor will have the option to modify the staging (with the Counties approval) developed by the designer.

Item 0003

- Kevin LaGreca of the Sells/PB Joint Venture (Consultant) presented a typical, two-lane maintenance and protection of traffic scheme proposed for the reconstruction of New Hempstead Road between the Palisades Interstate Parkway and Little Tor Road. The scheme suggests placing temporary pavement on the north side of the roadway in order to get the required width of roadway that would allow two lanes of traffic and one lane of construction. As a result, the poles on the north side of New Hempstead Road from will require relocation prior to construction. The final pavement width will be less then that with the temporary pavement, therefore the new pole locations would be further away from the final pavement. Copies of the drawings showing the staging scheme will be sent to the utility agencies.

- The utility agencies were concerned whether or not there is sufficient right-of-way for the pole relocations. Bernie Kalus noted that the existing New Hempstead Road right-of-way is irregular. Because of the proposed widening of the roadway, additional right-of-way takings are required in some locations and will accommodate the relocated poles.

- It is not necessary to relocate underground duct banks throughout the entire New Hempstead Road corridor unless a specific conflict occurs with the proposed design.

4. Special considerations by the Consultant should be made during the drainage design as not to conflict with existing underground utilities.

5. Joe Pyzowski noted that he would like to have the overhead utilities go underground on Main Street near the courthouse lawn. The location of riser poles will be discussed in the next meeting scheduled for February.

6. Kevin LaGreca will send a letter and drawings (staging plans and utility plans with poles and pole numbers) to the utility agencies.

   Joe Pyzowski noted that construction work might commence in spring, 2006. The construction schedule will incorporate the time required to relocate the utilities.

7. The utility companies will provide sketches next meeting depicting their anticipated locations for the relocated utilities, which would help develop completed maintenance and protection of traffic plans.

Minutes of Meeting Prepared by Sells/PB Joint Venture

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MEETING AGENDA
UTILITY ISSUES

The purpose of the meeting is to discuss the open items from the initial utility meeting held on August 28, 2003 and initiate a bi-monthly schedule of utility coordination.

1. Open Issues from Last meeting

ITEM	DESCRIPTION	STATUS	START	DUE	BALL IN COURT
00001	Funding for utility relocation work was brought up by Verizon. It was questioned whether or not the County would be paying for both the underground installations and overhead relocation of lines. The County stated that the additional cost associated with installing facilities underground in the downtown area would be reimbursed to the utility companies. In other words between Little Tor Road and North Main Street the companies would be responsible for the costs that would have been incurred to adjust the aerial facilities to a new above ground location but would be reimbursed for incremental cost increases to reconstruct underground. The costs for all other relocations made necessary by the project are the responsibility of the utility owners.	Open	8/28/03		RCHD
00002	It was noted that with the anticipated need for retaining walls with safety barriers, the area of Phillips Hill Road would be of concern for pole relocations. As such, underground relocation in this area may be necessary. Mr. James Tannhauser of Orange and Rockland stated that three electric circuits run through this area and it would not be possible to relocate that underground. Orange and Rockland will determine the extent of where the three circuits are located and will report back to the County.	Open	8/28/03		O&R
00003	MPT is a concern particularly due to full depth reconstruction. It is desirable to have utilities perform their work prior to roadway construction to take full advantage of shifting traffic to the shoulder areas.	Open	8/28/03	12/16/03	Sells/PB
Next open item will be 00004. All open items will be carried through on the meeting minutes.					

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2. Aerial Relocations in Rural Section
    a. Design provisions
    b. Special circumstances
        i. Restrictions between June and September
    c. Tree trimming provisions
3. Design of Underground Utilities in Urban Section
    a. Funding
    b. Design issues
        i. Switches, transformers
        ii. Minimum distance to consider underground installations
    c. Schedule
4. Maintenance and Protection of Traffic
    a. Typical staging scheme
    b. Phillips Hill area
    c. Required up-front activities

Memorandum

March 31, 2010

From: Joe Pyzowski

To: File: 3273

RE: O&R Meeting to resolve service connection requirements and division of work

A meeting was held at the Highway Department to discuss electric work for the ZNew Hempstead Road project. Those in attendance were:

Jim Tanhauser
Anthony Vasquez
Anthony _____
Joe Pyzowski

Electric Services

Rueben Gittleman and Residence Opposite Jail – County Contractor to bring existing electric primary cable in duct to new pole. Connections at pole by O&R

Highway Department – O&R to run duct and primary cable from pole on Eberling to new 3-Phase Junction Box and make connections at box. County Contractor to bring existing primary service cable (from Allison Paris Building) in duct to new 3-phase junction box for connection by O&R.

County Contractor to install concrete pad for pad mount transformer. O&R to supply and install transformer. County Contractor to bring existing cable in duct from Highway Department and connect to new pad mount transformer.

Sain Building – County Contractor to install new primary service cable from Sain Building to new pole installed by O&R. County Contractor to make connections at Sain Building; O&R to make connections at pole.

Bank of NY – County Contractor to install concrete pad for pad mount transformer. O&R to supply and install transformer. County Contractor to install new primary service cable from transformer to new pole installed by O&R. County Contractor to make connections at transformer; O&R to make connections at pole. County Contractor to bring existing cable in duct from bank of New York and connect to new pad mount transformer.

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MEETING MINUTES

Date: November 7, 2008

Time: 9:00 A.M.

Place: Rockland County Highway Department
23 New Hempstead Road
New City, NY 10956

Project: New Hempstead Road Reconstruction
Palisades Parkway to Route 304
PIN 8755.23, RC3273 (PB 26533, Sells 01007)

Purpose: Utility Meeting

Attendance:

Joe Pyzowski	RCHD	845-638-5060
Bernie Kalus	Sells/PB Joint Venture	914-747-1120
Tim Hurley	Sells/PB Joint Venture	914-747-1120
Fred Clark	O&R Gas	845-577-3305
Ryan Attianese	O&R Gas	845-577-3283
Dennis Haney	Cablevision	845-987-0221 x248
Tanyo Parashkevov	United Water	201-986-4750
Jim Tannhauser	O&R Electric	845-577-3201
Absent	Verizon	

Meeting Discussion:

1. The project is slated to be let in late 2009, with construction beginning in the spring of 2010. A 2 year construction period is anticipated.

2. Copies (11 x 17) of the drainage and utility plans and New Hempstead Road profiles were provided to each attendee.

3. SELLS reviewed the plans, focusing on the main areas that require utility relocations.
   A. Culvert replacement near Palisade Parkway ramps may impact the gas pipe in that area.
   B. Some areas of roadway reconstruction will require the use of non-vibratory rollers to protect utility lines.
   C. It is unlikely that normal minimum separation of 10' for water, storm drainage and sanitary sewer lines will be achieved.
   D. There is a potential R.O.W. issue along West Clarkstown Road regarding the location of O&R poles on private property. O&R will keep the County informed.

E. A culvert replacement on Little Tor Road has been added to the project. SELLS will need the existing utility locations in this area. SELLS will provide base mapping to each utility owner for verification.
F. SELLS will provide each utility company with the proposed MPT plans for the S-curve portion of the project. The deep cut is a concern for maintaining utility services during the work.

4. Each utility will inform the County how their relocations should be handled. The work can be included in the County's construction contract. The utility company can prepare their own designs or can contract with SELLS to provide utility design services. If utility work forces will be used, the construction contractor can still perform excavation/backfill operations. A separate cost share will be developed for each utility. The utility owners were requested to notify the County of their decision prior to the end of 2008.
5. SELLS can provide full-size drawings to each utility with only their individual relocations shown for clarity. This should be coordinated over the upcoming weeks.
6. Signed utility agreements and deposits will be required.
7. O&R Electric cannot perform major work during the summer months. Gas work is restricted over the winter months.
8. Verizon will be contacted again and provided with these minutes.

Cc: All attendees, Andrew Clarke (PB), and Verizon representative

DRAFT Minutes of Meeting Prepared by Sells/PB Joint Venture

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DRAFT MEETING MINUTES

Date: May 27, 2005

Time: 9:00A.M.

Place: Rockland County Highway Department
23 New Hempstead Road
New City, NY 10956

Project: New Hempstead Road Reconstruction
Palisades Parkway to Route 304
PIN 8755.23, RC3273 (PB 26533)

Purpose: Utility Meeting

Attendance:

Joseph Pyzowski	RC Highway Department	845-638-5060
Steven Smith	Sells/PB Joint Venture	914-747-1120
Jared Anderson	Sells/PB Joint Venture	914-747-1120
Bernie Kalus	Sells/PB Joint Venture	914-747-1120
Kevin LaGreca	Sells/PB Joint Venture	212-631-3859
James Tannhauser	O&R Electric	845-577-3201
Fred Clark	O&R Gas	845-577-3305
Shirlee Mcleod	Verizon	914-741-8371
Tom Chase	Cablevision	845-624-3500 x293
Dennis Haney	Cablevision	201-954-3857
Michael Piemontesi	BS&J Inc.	201-767-3111
Ron von Autenried	BS&J Inc.	201-767-3111
Joe LaFiandra	RC Sewer Dist. 1	845-365-6111

Documents Exchanged at Meeting:

1. Sells/PB provided revised drawings for preliminary design of the bridge over Demarest Kill for Sewer and Gas, and updated MPT staging drawings at the S-curve for each utility agency.
2. RC Sewer provided RC Sewer Specifications, plan markups, and plates for Sells/PB.
3. O&R Gas provided a summary of gas main depth for Sells/PB and RCHD.
4. BS&J provided a preliminary assessment of water main replacement limits.

Meeting Discussion (see attached Agenda):

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1. GPR/Sonar subsurface exploration:
   - O&R Gas performed an internal study on their gas mains and provided a summary of gas main depths in table format for Sells/PB and RCHD review. All bare steel pipes within project limits are planned for replacement.
   - BS&J (for United Water) solicited the services of U-Survey to perform GPR survey and provided Sells/PB and RCHD with a preliminary assessment of water main that is 2 feet below or shallower than the proposed pavement box. This total is approximately 3200 feet, but may be as high as 4000 feet due to the need for replacement of smaller segments between longer runs of replacement. UW will verify final replacement limits.
   - BS&J mentioned the possibility of using temporary water lines to maintain service while performing new main installation.

2. Updated water main exposure and sensitive area drawings based on GPR:
   - Once the limits for water main replacement are finalized by UW, these drawings will be updated.

3. Updated MPT alternative at S-curve:
   - Sells/PB presented and provided updated maintenance and protection of traffic (MPT) stages for reconstruction of the s-curve.
   - Prior to Stage 1, utility poles will need to be moved.
   - Water and Sewer relocations should take place in Stage 1 or 2. If only temporary in Stage 1 or 2, then permanent by Stage 4.
   - Relocated poles will need to be checked against the right-of-way.

4. Update on fire hydrant options at Phillips Hill:
   - The fire hydrant currently on NHR on the hill can be relocated to one end of the parapet wall. [illegible]
   - A fire hydrant will be added in the vicinity of John Street.
   - A follow-up letter will be sent to the Fire Department describing the layout at Phillips Hill.

5. Additional comments on the Demarest Kill Structure:
   - RC Sewer will be replacing their line with ductile iron pipe. A sleeve can be provided in the foundation of the proposed structure and is recommended by Sells/PB and RCHD.
   - Gas can be facilitated in the sidewalk by providing a sleeve for the 4" gas lines.
   - A set of plans was provided to RC Sewer and Gas. A set will be sent to BS&J in PDF format

6. Verizon/O&R pole relocations, conduit relocations, contract plans & specifications:

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- Verizon will follow O&R with their overhead relocations. O&R electric can not disrupt service between July 1 and September 30.
- They are currently investigating their underground lines along the road which are believed to be "dead" from the PIP to Main Street.
- A field meeting will be scheduled in July with Verizon and O&R to finalize the pole locations and check the layout's impact on the MPT scheme proposed for the "S-curve"

7. Finalize utility upgrades/utility corridor:
   - Telephone, cable and electric are all agreeable to the use of the Eberling-Sain Building-Bank of NY routing.
   - RCHD will verify if an easement is required.

8. Rockland County Sewer:
   - Sewer provided their specifications (including a special seal spec), plates and comments on full size plans for Sells/PB.
   - RCSD would like to see more detailed information regarding the work at Phillips Hill.
   - RCHD Contractor may perform the work; however, all required specs will need to be provided in the bid book.
   - MH's may be raised up to 12" without replacement. Any manholes to be lowered below the brick layer should be replaced.
   - He would like to know if any drop manholes are affected.
   - There is a sanitary sewer line parallel to Demarest Kill that may affect the new structure. This line will be added to the plans.
   - There was discussion on abandonment of manholes and lines. If any outlets are plugged, K-crete or similar products should be used. Additionally, RCHD prefers that abandoned pipes be filled with low strength slurry concrete.
   - Any need for bypass or temporary lines should go through the Sewer Dist.
   - Once plans are updated, Sells/PB will provide a set for the Sewer Dist.

9. Project Update and Next Meeting:
   - The next NHR utility meeting is tentatively scheduled for early to mid July, 2005 in the field for discussion of pole relocations.
   - Construction is currently scheduled for the spring 2007. O&R's restriction on service disruption (July 1 to September 30) may impact pole relocations during the first construction season in 2007.
   - The next step will be ROW acquisition following DOT Design Approval, which is expected in June.
   - The updated project schedule is as follows:
     - Legislative approval expected by the end of 2006.
     - Start construction in Spring 2007.

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New Hempstead Road Reconstruction
Utility Meeting Agenda
May 27, 2005, 9:00 A.M.

1. GPR/Sonar subsurface exploration
   - UW/BS&J and O&R to provide results
2. Updated water main exposure and sensitive area drawings based on GPR
   - UW/BS&J to provide updated areas of exposure for further discussion
3. Updated M&PT alternatives at S-curve with utilities on plans
   - Sells/PB to provide updated full size M&PT drawings of the S-curve area
4. Update on fire hydrant options at Phillips Hill
   - UW/BS&J to provide update
5. Any additional concerns at the Demarest Kill structure
   - Update on gas main placement
6. Verizon update on pole relocations, conduit relocations, inclusion in contract plans & specs, and any additional concerns.
7. Finalize utility upgrades – decision to use Eberling Drive and corridor behind Bank property.
   - Which utility companies will use the routing?
8. Rockland County Sewer
   - Standard drawings need to be provided
   - Discuss possible replacement of sewer at the Demarest Kill Bridge
   - Verify if the construction work is to performed by the RC general contractor
9. Project schedule update and tentatively schedule next meeting
   - ROW acquisition update
   - Start of construction update
   - Time frame for next meeting

General Comments

1. The drafter depicted drop connections to manholes as parallel sewers. This is inaccurate. See specific comments for details.

2. In many cases, the diameters of the sewers on the drawings are inconsistent with Sewer District records. The drawings have been marked up to reflect District records. **However, the actual conditions must be verified in the field.**

3. Please refer to the District's Comprehensive Sewer Plans (Maps 4204, 4303 and 4304) for our manhole ID numbers and configuration of sewers. **However, as-built conditions must be verified in the field.**

Specific Comments

1. Drawing No. DR-2
   a. District Map 4204 indicates that the sewer diameter is 16 inches (406mm). However, Drawing No. DR-2 shows 305mm.

2. Drawing No. DR-5
   a. MH 44031 on New Hempstead Road is not shown. It should be about 11 meters west (upstream) of MH 24080.
   b. MH 44030 on Buena Vista Road is not shown. It should be about 16 meters north (downstream) of MH 24080.
   c. There is only one sewer pipe between MH 24080 and MH 24081. One or both manholes are drop manholes.

3. Drawing No. DR-6
   a. District Map 4204 does not indicate a connection between MH 24072 and MH 24073.
      i. The upstream connection to MH 24072 on Drawing No. DR-6 may be a house connection or an undocumented sewer extension.
      ii. MH 24073 is a terminal manhole.
   b. MH 24074 is a drop manhole.

4. Drawing No. DR-7
   a. MH 44071 on Sycamore Drive is a drop manhole.
   b. MH 24071 has two (2) drop connections.

5. Drawing No. DR-8
   a. District Map 4204 does not indicate a connection between MH 24042 and MH 24099.
      i. The upstream connection to MH 24042 is an abandoned force main.
      ii. MH 24099 is a terminal manhole.
   b. MH 24098 has two (2) drop connections.

6. Drawing No. DR-10
   a. MH 24030 is not shown. It should be about 37 meters east (downstream) of MH 24039.
   b. MH 24031 is not shown. It should be about 8 meters north (upstream) of MH 24030 on an 8-inch (203mm) diameter sewer extension north of New Hempstead Road, which the drawing also does not show.
   c. The drawing does not show an 8-inch (203mm) diameter sewer extension into MH 24030 from the south side of New Hempstead Road.

7. Drawing No. DR-13
   a. MH 24024 is shown isolated from the sewer main. The sewer main should run through the manhole.

8. Drawing No. DR-15
   a. MH 24020 is a drop manhole.

9. Drawing No. SPM-16
   a. MH 24017 is a drop manhole.
   b. The drawing number designation is inconsistent.

10. Drawing No. DR-17
    a. MH 24014 and MH 24015 are drop manholes.
    b. District Map 4303 indicates that the sewer pipe diameter increases from 10 inches (254mm) to 12 inches (305mm) at MH 24014, at the intersection with Henry Street. However, Drawing No. DR-17 shows this change occurs one manhole west of Henry Street, at MH 24015. Please verify in the field the location of the transition.

11. Drawing No. DR-18
    a. MH 24013 is a drop manhole.

12. Drawing No. DR-19
    a. MH 24011 at the intersection with John Street is a drop manhole.
    b. District Map 4303 indicates that the sewer diameter is 12 inches (305mm). However, Drawing No. DR-19 shows 406mm east of John Street. Please verify the pipe diameter.

13. Drawing No. DR-20
    a. Our records indicate that the sewer diameter is 12 inches (305mm) and increases to 15 inches (381mm) at Radcliff Drive. However, Drawing No. DR-20 shows 406mm. Please verify the pipe diameter.

14. Drawing No. DR-21
    a. Is existing MH 24005 to remain in order to maintain the house connections in the manhole?

15. Drawing No. DR-22
    a. The District has no record of the sewer extension on the north side of New Hempstead Road into MH 24002. It may be a private sewer or an undocumented extension.

16. Drawing No. DR-23
    a. The drawing does not show the 16-inch (406mm) interceptor sewer along the Demarest Kill flowing into MH 24001 from the south.
    b. District Map 4304 indicates that the diameter of the sewer main on New Hempstead Road increases from 12 inches (305mm) to 15 inches (381mm) at MH 24001. However, Drawing No. DR-23 indicates that the diameter of the sewer on New Hempstead Road is 406mm west (upstream) of MH 24001. Please verify in the field the location of the transition and the diameter of the pipe.

17. Drawing No. DR-24
    a. The drawing does not show the sewer main on South Main Street and Congers Road.

18. Drawing No. DR-26
    a. The diameter of the sewer on Little Tor Road is 12 inches (305mm).

New Hempstead Road Pipe Replacement Analysis

Proposed Lengths of Pipe To Be Replaced Within Critical Areas
Depth Survey Performed by U-Survey
UWNJ & BS&J

Station Start	Station End	Length of Pipe
1850	1990	459.32
2180	2300	393.70
2600	2660	196.85
2870	2940	229.66
3000	3100	328.08
3150	3210	196.85
3300	3360	196.85
3390	3580	623.36
4010	4180	557.74
	TOTAL	3582.02

Distance	Depth (INCHES)	PCM-AMPS	Field Description
0	56	Crossing	Ramclark Lane to Buena Vista
50	23		
100	38	12" WS	
150	35		Louis Rd Begin
200	43		
250	36		Storm Drain X
300	35		Glady's Begin
350	36		
400	30		
450	57		Storm Drain X
500	47		
550	48		
600	44		
650	44		
700	36		Rheinland Beginning
750	44		
800	41		
850	36		
900	45		
950	36		
1000	36		Sycamore End
1050	57		Storm Drain X
1100	50		
1150	36		
1200	36		
1250	43		
1300	48		W Clarkstown Rd Began
1350	36		" " end
1400	42		In Shoulder
1450	42		" "
1500	42		In Shoulder
1550	36		Back in Rd 1/2 foot
1600	-		Jogs Out 2' at TS
1650	33		In Road
1700	30		
1750	30		Back in Shoulder
1800	29		
1850	26		
1900	28		Begin Phillips Hill Rd
1950	52		End " "
2000	19		Jogs Out 10" in Road
2050	52		Rail
2100	42		" "
2150	30		" "
2200	44		" "
2250	44		" "
2300	46		" "

2350	36		Fire Hydr. Storm Drain X
2400	30		Rail
2450	47		" "
2500	48		" "
2550	48		" "
2600	60		
2650	70		
2700	72		
2750	60		
2800	42		
2850	36		
2900	36		
2950	36		Begin- Colonial Dr Storm Drain
3000	36		
3050	44		
3100	41		
3150	39		
3200	36		
3250	32		
3300	24		
3350	36		
3400	36		
3450	36		
3500	36		
3550	43		Homestead Lane Begin
3600	57		
3650	52		Allison Ct
3700	39		
3750	39		
3800	39		Storm Drain X
3850	39		
3900	37		
3950	29		
4000	28		
4050	28		
4100	24		
4150	20		
4200	31		Lynhaven
4250	33		
4300	35		
4350	36		Storm Drain X
4400	33		
4450	33		
4500	35		
4550	33		(2) Storm Drain X's
4600	27		
4650	31		Joan Dr (Begin)
4700	-		Joan End 15' Pix Lost Signal at Storm Drain
4750	48		

4800	33		
4850	32		
4900	45		Woodbine
4950	20		
5000	22		T/S
5050	32		Storm Drain X
5100	28		
5150	34		
5200	36		
5250	48		Haven Mill Rd
5300	36		Storm Drain X
5350	36		
5400	36		
5450	33		
5500	48		Storm Drain X
5550	31		End of Do Not Enter St
5600	32		
5650	36		
5700	48		
5750	48		
5800	57		
5850	44		Drain Crossing
5900	30		
5950	48		GV Lost Signal
6000	42		
6050	42		
6100	33		
6150	32		
6200	27		In Front 111 By GS
6250	30		
6300	27		E of Storm Drain - Pole 91/29
6350	36		Intersection Changes to PLX
6400	24		Rockland County Correctional Ctr Enterance - 40'
6450	30		Manhole Sewer
6500	30		
6550	27		
6600	22		
6650	30		
6700	33		Manhole Sewer
6750	34		Start Guard Rail
6800	27		
6850	36		20 East Sewer Manhole
6900	20		
6950	36		
7000	60		End of Guard Rail Sewer Manhole
7050	36		Pole 59353 / 41837
7100	72		
7150	62		
7200	60		

7250	50		T/S Storm Drains (2)
7300	60		Court House Driveway
7350	48		
7400	44		
7450	48		
7500	53		
7550	36		Storm Drain X
7600	45		
7650	40		
7700	30		Start of Bridge
7750	26		End of Bridge
7800	25		
7850	12		
7900	24		
7950	27		End 10' West T/S Main Street

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555 Pleasantville Road
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914.747.1120

MEETING MINUTES

Date: May 27, 2005

Time: 9:00A.M.

Place: Rockland County Highway Department
23 New Hempstead Road
New City, NY 10956

Project: New Hempstead Road Reconstruction
Palisades Parkway to Route 304
PIN 8755.23, RC3273 (PB 26533)

Purpose: Utility Meeting

Attendance:

Joseph Pyzowski	RC Highway Department	845-638-5060
Steven Smith	Sells/PB Joint Venture	914-747-1120
Jared Anderson	Sells/PB Joint Venture	914-747-1120
Bernie Kalus	Sells/PB Joint Venture	914-747-1120
Kevin LaGreca	Sells/PB Joint Venture	212-631-3859
James Tannhauser	O&R Electric	845-577-3201
Fred Clark	O&R Gas	845-577-3305
Shirlee Mcleod	Verizon	914-741-8371
Tom Chase	Cablevision	845-624-3500 x293
Dennis Haney	Cablevision	201-954-3857
Michael Piemontesi	BS&J Inc.	201-767-3111
Ron von Autenried	BS&J Inc.	201-767-3111
Joe LaFiandra	RC Sewer Dist. 1	845-365-6111

Documents Exchanged at Meeting:

1. Sells/PB provided revised drawings for preliminary design of the bridge over Demarest Kill for Sewer and Gas, and updated MPT staging drawings at the S-curve for each utility agency.
2. RC Sewer provided RC Sewer Specifications, plan markups, and plates for Sells/PB.
3. O&R Gas provided a summary of gas main depth for Sells/PB and RCHD.
4. BS&J provided a preliminary assessment of water main replacement limits.

Meeting Discussion (see attached Agenda):

1. GPR/Sonar subsurface exploration:
   - O&R Gas performed an internal study on their gas mains and provided a summary of gas main depths in table format for Sells/PB and RCHD review. All bare steel pipes within project limits are planned for replacement.
   - BS&J (for United Water) solicited the services of U-Survey to perform GPR survey and

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provided Sells/PB and RCHD with a preliminary assessment of water main that is 2 feet below or shallower than the proposed pavement box. This total is approximately 3200 feet, but may be as high as 4000 feet due to the need for replacement of smaller segments between longer runs of replacement. UW will verify final replacement limits.

- BS&J mentioned the possibility of using temporary water lines to maintain service while performing new main installation.

2. Updated water main exposure and sensitive area drawings based on GPR:
   - Once the limits for water main replacement are finalized by UW, these drawings will be updated.

3. Updated MPT alternative at S-curve:
   - Sells/PB presented and provided updated maintenance and protection of traffic (MPT) stages for reconstruction of the s-curve.
   - Prior to Stage 1, utility poles will need to be moved.
   - Water and Sewer relocations should take place in Stage 1 or 2. If only temporary in Stage 1 or 2, then permanent by Stage 4.
   - Relocated poles will need to be checked against the right-of-way.

4. Update on fire hydrant options at Phillips Hill:
   - The fire hydrant currently on NHR on the hill may be relocated to one end of the parapet wall as per Mark Papenmeyer, Chief Fire Safety Inspector, Town of Clarkstown (9/14/04 letter)
   - A fire hydrant will be added in the vicinity of John Street at the request of the Fire Safety Inspector.
   - A follow-up letter will be sent to the Fire Safety Inspector confirming the changes to the fire protection system.

5. Additional comments on the Demarest Kill Structure:
   - RC Sewer will be replacing their line with ductile iron pipe. A sleeve can be provided in the foundation of the proposed structure and is recommended by Sells/PB and RCHD.
   - Gas can be facilitated in the sidewalk by providing a sleeve for the 4" gas service. A set of plans was provided to RC Sewer and O&R Gas. A set will be sent to BS&J in PDF format

6. Verizon/O&R pole relocations, conduit relocations, contract plans & specifications:
   - Verizon will follow O&R with their overhead relocations. O&R electric can not disrupt service between July 1 and September 30.
   - Verizon is currently investigating their underground lines along New Hempstead Road which are believed to be "dead" from the PIP to Main Street. Ms. Mcleod will confirm the status of the duct banks and will report if other companies occupy or lease space in the existing ducts.
   - A field meeting will be scheduled in July with Verizon and O&R to finalize the pole locations and check the layout's impact on the MPT scheme proposed for the "S-curve"

7. Finalize utility upgrades/utility corridor:
   - Telephone, cable and electric are all agreeable to the use of the Eberling-Sain Building-

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Bank of NY routing.

- RCHD will verify if an easement is required.

8. Rockland County Sewer:
   - Sewer provided their specifications (including a special seal spec), plates and comments on full size plans for Sells/PB.
   - RCSD would like to see more detailed information regarding the work at Phillips Hill.
   - RCHD Contractor may perform the work; however, all required specs will need to be provided in the bid book.
   - MH's may be raised a total of 12" above the cone section without replacement of the structure. Any manholes to be lowered below the brick layer require pre-cast sections to be removed and the cone section to be reset.
   - He would like to know if any drop manholes are affected.
   - There is a sanitary sewer line parallel to Demarest Kill that may affect the new structure. This line will be added to the plans.
   - There was discussion on abandonment of manholes and lines. If any outlets are plugged, Controlled Low Strength Material (K-crete) or similar products should be used.
   - Any need for bypass or temporary lines must be approved by the Sewer Dist.
   - Once plans are updated, Sells/PB will provide a set for the Sewer Dist.

9. Project Update and Next Meeting:
   - The next NHR utility meeting is tentatively scheduled for early to mid July, 2005 in the field for discussion of pole relocations.
   - Construction is currently scheduled to begin in the spring 2007. Aerial utility work should be progressed during Phase I of construction. Pole placement can be progressed during the summer shutdown (7/1 to 9/30) period.
   - The next step will be ROW acquisition following DOT Design Approval, which is expected in June.
   - The updated project schedule is as follows:
     - Legislative approval expected by the end of 2006.
     - Start construction in Spring 2007.

Minutes of Meeting Prepared by Sells/PB Joint Venture

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New Hempstead Road Reconstruction
Utility Meeting Agenda
May 27, 2005, 9:00 A.M.

1. GPR/Sonar subsurface exploration
   - UW/BS&J and O&R to provide results
2. Updated water main exposure and sensitive area drawings based on GPR
   - UW/BS&J to provide updated areas of exposure for further discussion
3. Updated M&PT alternatives at S-curve with utilities on plans
   - Sells/PB to provide updated full size M&PT drawings of the S-curve area
4. Update on fire hydrant options at Phillips Hill
   - UW/BS&J to provide update
5. Any additional concerns at the Demarest Kill structure
   - Update on gas main placement
6. Verizon update on pole relocations, conduit relocations, inclusion in contract plans & specs, and any additional concerns.
7. Finalize utility upgrades – decision to use Eberling Drive and corridor behind Bank property.
   - Which utility companies will use the routing?
8. Rockland County Sewer
   - Standard drawings need to be provided
   - Discuss possible replacement of sewer at the Demarest Kill Bridge
   - Verify if the construction work is to performed by the RC general contractor
9. Project schedule update and tentatively schedule next meeting
   - ROW acquisition update
   - Start of construction update
   - Time frame for next meeting

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MEETING MINUTES

Date: January 12, 2005

Time: 9:00A.M.

Place: Rockland County Highway Department
23 New Hempstead Road
New City, NY 10956

Project: New Hempstead Road Reconstruction
Palisades Parkway to Route 304
PIN 8755.23, RC3273 (PB 26533)

Purpose: Utility Meeting

Attendance:

Joseph Pyzowski	Rockland County Highway	845-638-5060
Jared Anderson	Sells/PB Joint Venture	914-747-1120
Bernie Kalus	Sells/PB Joint Venture	914-747-1120
Kevin LaGreca	Sells/PB Joint Venture	212-631-3859
James Tannhauser	O&R Electric	845-577-3201
Fred Clark	O&R Gas	845-577-3305
Debbie Dimeo	O&R Gas	845-577-2000
Michael Piemontesi	BS&J Inc.	201-767-3111
Guido von Autenried	BS&J Inc.	201-767-3178 (fax)
Luke Kalarickal	Clarkstown Sewer	845-639-2111

Documents Exchanged at Meeting:

1. Sells/PB provided drawings for conceptual design of the bridge over Demarest Kill and staging scheme at the S-curve.

Meeting Discussion (see attached Agenda):

1. GPR/Sonar subsurface exploration:
   Both O&R and BS&J (representing United Water) have researched the use of GPR technology to locate underground utilities. U-Survey has been solicited to perform the GPR work for O&R and United Water. O&R and United Water determined that it would not be beneficial to perform the GPR work together and that both utilities will be investigated separately. United Water would only perform GPR work in critical areas where the future roadway profile would be lowered. O&R are prepared to solicit quotes

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for the GPR work to be performed by early spring, 2005. O&R anticipates performing GPR work for the entire project length. The existing water main may be replaced in many locations due to age and type of material.

2. Updated water main exposure and sensitive area drawings:
   These drawings will be provided upon completion of GPR investigation by O&R and United Water.

3. MPT alternative at S-curve:
   Sells/PB presented maintenance and protection of traffic (MPT) stages for reconstruction of the s-curve. It includes various stages in which the proposed retaining wall and utilities can be constructed so that vehicular traffic can be maintained. A drawing for each stage was provided and the location of utilities and work zones was discussed for each. Two borings will be done to determine existence/elevation of rock in order to evaluate the methods of sheeting that can be employed. Detours may be necessary and will be investigated further as the project develops. Sells/PB will add the utilities to the MPT drawings and send (full size) them to the utility companies.

4. Utility options at the proposed Demarest Kill Bridge:
   - Two types of bridge designs have been proposed: Conspan and Hyspan. Conspan has tentatively been selected by Rockland County.

   - Sells/PB proposed that the bridge abutments and footings straddle the existing or relocated sanitary sewer. In addition, the relocated water line would be installed below the footing, between the piles. Joe suggested replacing the sanitary sewer, and possibly other utilities, and installing each in a casing pipe (sleeving) in the vicinity of the new bridge. Replacing and sleeving the sanitary sewer may be considered a betterment thus requiring funding by the owner. Utilities are not to be attached to the bridge fascia because of its negative impact to the visual effects of the bridge and downtown area.

   - Ideas for the relocation of the gas main were discussed. One includes routing the gas main behind the bank, which would require long service connections toward Main Street. Another includes raising the curb height to accommodate a sidewalk installation. Another includes installing the gas main within a strengthened parapet wall. The last includes installing the gas main under Demarest Kill, which is preferable to Rockland County. The gas main would be 4-inch plastic within a 6-inch conduit. O&R will provide options for relocating the gas main for Rockland County's approval.

5. Fire hydrant options at the proposed Phillips Hill parapet wall:
   BS&J will coordinate with Tanyo from United Water options for providing fire hydrants along Phillips Hill Road. An existing fire hydrant is located in the middle of Phillips Hill and beyond a guide rail, which would be replaced with a parapet wall. It has been

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proposed that a fire hydrant be placed at both the beginning and end of the parapet wall in place of the existing one located in the middle of Phillips Hill.

6. Verizon/O&R pole relocations, conduit relocations, contract plans & specifications:
   O&R requested that the New Hempstead Road contractor perform early tree and vegetation clearing before the relocation of utility poles and wires. It has been proposed that poles within the s-curve area be performed in the MPT stage II, and that they can be located in front of the proposed retaining wall because of the clear zone side slope, and horizontal and vertical roadway geometry.

7. Verizon status update:
   There were no representatives from Verizon present at the meeting, as well as the last utility coordination meeting on November 5, 2004. It is imperative that Verizon attend all utility meetings since they will be relocating both overhead and underground facilities, and the project staging and schedule is dependent on their cooperation both during planning and construction. Their absence is especially troublesome considering past performance on the North Main Street project in New City.

8. Sewer relocations at s-curve:
   The sewer design work will be included in the Sells/PB contract, and the sewer construction will be included in the contract of the selected RC Contractor pending confirmation by Luke Kalarickal and Marty Dolphin. Sewer modifications are required at the s-curve and at Phillips Hill Road as a result of horizontal and vertical alignment adjustments. Many sewer manhole frames and castings will require resetting. Sells/PB will send full size NHR drawings to Marty Dolphin at the Rockland County Sewer District 1 for coordination. Sewer services are the ownership of each township, and the county is responsible for sewers with diameters greater than 8-inches.

9. Miscellaneous:
   - The next NHR utility meeting is tentatively scheduled for early May, 2005 with the anticipation of GPR work completed.
   - Property acquisition complications may delay beginning of construction, which is currently scheduled for the spring 2006.
   - The minimum depth of cover for utilities in county right-of-way is 3-feet

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New Hempstead Road Reconstruction
Utility Meeting Agenda
January 12, 2005, 9:00 A.M.

1. GPR/Sonar subsurface exploration.
   - United Water, BS&J Inc., (UW Consultant), and O&R Gas to provide update on the status of the explorations

2. Updated water main exposure and sensitive area drawings.
   - United Water and BS&J Inc. to provide updated drawings and information for further discussion

3. M&PT alternatives at S-curve.
   - Sells/PB (RCHD Consultant) to provide M&PT scheme for discussion

4. Utility options at the proposed Demarest Kill structure.
   - Sells/PB to discuss findings on carrying utilities on, through, or around the proposed structure
   - Utility agencies to discuss the current locations of their facilities in the area of the structure and their future location preferences

5. Fire hydrant options at the proposed Phillips Hill parapet wall.
   - United Water to provide access options to the fire hydrant

6. Verizon/O&R pole relocations, conduit relocations, contract plans & specs, and any additional concerns.
   - Verizon and O&R Electric to determine who will design their proposed/relocated facilities, if the work will be included in the County's contract plans, and if special specifications will be required

7. Verizon status update
   - Verizon to update on status of overhead and underground relocations

8. Sewer relocations at S-curve
   - Sells/PB to show extent of impact to sewer in the S-curve reconstruction
   - Sewer department to determine who will design their facilities, if the work will be included in the County's contract plans, and if special specifications will be required.

9. Finalize utility upgrades.
   - Utility companies to finalize the extent of their required and desired upgrades to be included as a part of this project

10. County's minimum cover depth for new underground facilities.
    - Joe Pyzowski of RCHD to provide a minimum depth of cover for proposed facilities.

New Hempstead Road Reconstruction
Utility Meeting Agenda

January 12, 2005, 9:00 A.M.

DEBBIE DAMEO

1. GPR/Sonar subsurface exploration.
   - United Water, BS&J Inc., (UW Consultant), and O&R Gas to provide update on the status of the explorations

     V-SURVEY EARLY SPRING
2. Updated water main exposure and sensitive area drawings.
   - United Water and BS&J Inc. to provide updated drawings and information for → further discussion

     V-SURVEY → EARLY SPRING FOLLOW UP FOR SCHED W/TARK
3. M&PT alternatives at S-curve.
   - Sells/PB (RCHD Consultant) to provide M&PT scheme for discussion

     FULL SIZE DRAWINGS TO O&R & OTHER UTILIT
4. Utility options at the proposed Demarest Kill structure.
   - Sells/PB to discuss findings on carrying utilities on, through, or around the proposed structure
   - Utility agencies to discuss the current locations of their facilities in the area of the structure and their future location preferences

GAS 6" SLEEVE
SD #1 TO BE
INVITED TO
NEXT MTG.

5. Fire hydrant options at the proposed Phillips Hill parapet wall.
   - United Water to provide access options to the fire hydrant

   POSSIBLY FURTHER DISCUSSIONS
6. Verizon/O&R pole relocations, conduit relocations, contract plans & specs, and any additional concerns.
   - Verizon and O&R Electric to determine who will design their proposed/relocated facilities, if the work will be included in the County's contract plans, and if special specifications will be required
7. Verizon status update
   - Verizon to update on status of overhead and underground relocations
8. Sewer relocations at S-curve
   - Sells/PB to show extent of impact to sewer in the S-curve reconstruction
   - Sewer department to determine who will design their facilities, if the work will be included in the County's contract plans, and if special specifications will be required.
9. Finalize utility upgrades.
   - Utility companies to finalize the extent of their required and desired upgrades to be included as a part of this project
10. County's minimum cover depth for new underground facilities.
    - Joe Pyzowski of RCHD to provide a minimum depth of cover for proposed facilities.

      3.0 FT

      PAVEMENT SECT 2'+

NEXT MEETING EARLY MAY

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MEETING MINUTES

Date: November 5, 2004

Time: 9:00A.M.

Place: Rockland County Highway Department
23 New Hempstead Road
New City, NY 10956

Project: New Hempstead Road Reconstruction:
Palisades Parkway to Route 304
PIN 8755.23, RC3273 (PB 26533 CHS 01007)

Purpose: Utility Meeting

Attendance:

Joseph Pyzowski	RC Highway	845-638-5060
Jared Anderson	Sells/PB Joint Venture	914-747-1120
Bernie Kalus	Sells/PB Joint Venture	914-747-1120
Kevin LaGreca	Sells/PB Joint Venture	212-631-3859
Michael Piemontesi	BS&J Inc.	201-767-3111
Ronald von Autenried	BS&J Inc.	201-767-3178 (fax)
Tanyo Pareshkevov	United Water	845-623-1500 (x2232)
Brendan Sullivan	O&R Electric	845-577-3651
Fred Clark	O&R Gas	845-577-3305
Tom Chase	Cablevision	845-624-3500 (x293)

Documents Exchanged at Meeting:

1. There was no exchange of documents at the meeting.

Meeting Discussion:

1. It was mentioned that there were no design changes since the last meeting that would affect the utility companies.

2. United Water and Consultant (BS&J):

   - Concerns were expressed over the need for potentially substantial amounts of temporary piping while maintaining all hydrant and house service.

   - Assuming there is 4 foot of cover removing 2 feet of earth to install new

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pavement section poses a risk to the water mains, especially while operating heavy equipment above them.

- Joe Pyzowski (RCHD) mentioned that all utility and construction work will need to be properly staged, whether or not the County's contractor performs the work. He also suggested the installation of new water mains prior to exposing any existing lines that are deteriorating or in risk of failure.

- There was concern over damage to existing mains and the service disruptions that could result within the project area as well as surrounding areas, particularly if the county contractor is not best suited to perform water main work.

- Within the project limits there may be high and low pressure districts, which will need to be distinguished prior to commencing work.

- BS&J prepared drawings of the proposed roadway profile with respect to the existing ground and the sensitivity of affecting these existing pipes based on the proposed cuts/fills. These drawings will be revised once the depths of cover are more accurately determined.

- Test holes will be included in the contract drawings for additional subsurface investigations, if necessary.

- An average production rate of 80 feet per day of water main is a good value to use with full road closures. This rate includes new connections, disinfection, pressure testing and wet taps.

- Diversion valves may also be added throughout the project limits to aid in the diversion of service.

- The County contractor performed the water main work on the Main Street project in New City. United Water stated that they prefer their work be prepared under separate contract due to concerns over knowledge of the system and the ramifications of service disruptions. The County contractor will be paid using prevailing wages. All contract documents for water service will be developed by United Water. The County's awarded contractor will be invited to submit a bid along with other contractors. The County's contract drawings will not include water related pay items and details.

- Depth finding studies (GPR/Sonar) are being considered by both the water and gas utilities to more accurately determine the depth of cover of their mains. Typically, 500-1000 feet of investigation may occur within a day. The County typically waves fees on permits when the work is associated with a County capital project. Both will verify whether or not this can be done and prepare their findings for the

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next utility meeting (early January 2005). The companies will also use the information to prepare preliminary facility replacement plans to be reviewed and discussed at Januarys meeting.

- Due to the cut at the S-curve, a complete road closure is preferred by water and gas, however Sells/PB will investigate MPT schemes and production rates at this location. The potential for a utility corridor along the north side of the road between the proposed wall and proposed roadway edge was also discussed as a potential option. These will be discussed in more detail at the January 2005 meeting.

- Concerns were expressed at the Demarest Kill Bridge. United Water will determine if their line runs underneath the stream or within the structure. It may be possible to dead end water service on either side of the bridge and run the water main in a shared utility corridor behind the Sain Building and Bank of NY property, similar to the proposed alignment of overhead utilities. The County's Consultant will investigate possible utility accommodation options with the bridge system vendor/designer and be prepared to discuss at January utility meeting.

- At the Phillips Hill parapet wall, Tanyo will investigate hydrant access options at the traffic safety wall. the possibility of a raised hydrant above the wall.

3. O&R Gas:

- Fred Clark expressed concern over the depth to the gas mains, which may only be 18 to 24 inches. He will investigate whether or not GPR/Sonar can be used to more accurately determine the cover depth. Joe Pyzowski mentioned that the County will specify a minimum installation depth for new facilities. This depth will likely be at least 30 inches.

- Similar to water, gas prefers that the work be done by a Contractor who is qualified to perform the gas work. No gas related items will be included in the County's contract drawings. O&R will put together a separate contract document for bid.

- O&R is also in favor of detours with closures of segments of NHR to speed up gas main replacement, particularly at the S-curve.

- Fred Clark will develop a matrix of gas system impacts and conflicts for the January meeting.

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4. O&R Electric:

   - Brendan Sullivan plans to begin work at the PIP instead of at Buena Vista Road. O&R will replace an old riser pole and continue along a straight path to Buena Vista Road.

   - The Little Tor NE corner may be reconfigured affecting the pole across the street on the SE corner.

   - Drawings will be updated to reflect these changes.

5. Cablevision:

   - Tom Chase had no comments.

6. Sewer:

   - Luke Kalarickal was not present, however it was noted that typically, 10 feet of lateral clearance is required from water mains. The question arose regarding the necessity for the Board of Health to review new water and sewer locations. Joe Pyzowski. This will be investigated

   - Sewer relocation will be critical in the S-curve area and at the Demarest Kill culvert. Joe Pyzowski will be in touch with Luke regarding their proposed work.

7. Verizon:

   - Shirlee McCleod was not able to attend the meeting due to service outages in the area, but a copy of the minutes will be sent to her.

8. Miscellaneous:

   - Detours involving closure of segments of NHR are preferred to assist in speeding up all utility work. Detours and their impacts will be further investigated by Sells/PB.

   - The project is on schedule for a Fall 2005 PS&E with Spring 2006 construction. It was mentioned that preliminary clearing and grading may begin in the winter if conditions permit. This may also facilitate the utilities to begin doing their work (i.e. pole relocations)

   - Joe Pyzowski reiterated the importance of considering all possible utility work during the reconstruction project. The intent of the project is to provide an entirely new road with a 30+ year service life. This may be the only opportunity

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for facilities to perform major upgrades in the project corridor.

- The next meeting date is January 12, 2005.

Minutes prepared by the Sells/PB Joint Venture

New Hempstead Road Reconstruction
Utility Meeting Agenda
November 5, 2004, 9:00 A.M.

1. Review current project design status with respect to any additional utility impacts since the last meeting.
2. Discuss the extent of each utility company's proposed work – i.e. planned replacements, upgrades, and work necessary due to roadway reconstruction.
3. Discuss timeframes and sequencing to complete the proposed utility work.
4. Discuss whether or not the County's contractor can perform the proposed utility work, and estimated costs.
5. Discuss whether or not the County's consultant can perform the design for the proposed utility work.

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MEETING MINUTES

Date: December 15, 2003

Time: 10:00A.M.

Place: Rockland County Highway Department
23 New Hempstead Road
New City, NY 10956

Project: New Hempstead Road Corridor Safety Study:
Palisades Parkway to Route 304
PIN 8755.23, RC3273 (PB 26533)

Purpose: Utility Meeting

Attendance:

Joseph Pyzowski	Rockland County Highway	845-638-5060
Kok Meng Png	Rockland County Highway	845-638-5060
John Rapetti	Sells/PB Joint Venture	914-747-1120
Jared Anderson	Sells/PB Joint Venture	914-747-1120
Bernie Kalus	Sells/PB Joint Venture	914-747-1120
Kevin LaGreca	Sells/PB Joint Venture	212-631-3859
Thomas McArdle	Verizon Engineering	914-741-8740
Shirlee Mclero	Verizon Engineering	914-241-8371
James Tannhauser	Orange and Rockland	845-577-3201
Brendan Sullivan	Orange and Rockland	845-577-3651
Patrick Wenz	Cablevision	845-624-3500 (x212)

Documents Exchanged at Meeting:

1. There were no documents exchanged at the meeting. Kevin LaGreca of the Sells/PB Joint Venture (Consultant) intends to mail a package to each utility agency. The package will include the maintenance and protection of traffic drawings presented within the meeting.

Meeting Discussion (see attached Agenda):

1. Bernie Kalus of the Sells/PB Joint Venture (Consultant) provided a general overview of the project's progress. He stated that the utility relocation in conjunction with the proposed maintenance and protection of traffic work is the key aspect to ensure the project schedule is maintained. The project intends to relocate the overhead utilities to underground between Little Tor Road and Main Street. The project team members discussed the open issue log developed at the last utility meeting.

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2. Joe Pyzowski from Rockland County mentioned that the purpose of these utility meetings is to coordinate the New Hempstead Road construction and scheduling needs of both the utility agencies and Rockland County. The recent North Main Street Improvements project experienced problems related to utility relocations which we do not wish to repeat It is expected that this coordination will facilitate the maintenance of the overall project schedule, which would prove to be a benefit to all.

3. The following summarizes the discussions and conclusions for each open issue log:

Item 0001

- Joe Pyzowski explained that the cost for relocating utilities on county right-of-way as a result of the New Hempstead Road Project is the responsibility of the utility agencies. Federally funded projects in New York State do not reimburse utility agencies for utility relocation work.

- Joe Pyzowski requested that the utility agencies prepare cost estimates for relocating the utilities on New Hempstead Road between Little Tor Road and Main Street. The estimates would contain the cost that would have been incurred to adjust the aerial utilities above ground and the cost difference to replace the aerial facilities with underground. The Consultant will provide the cost for excavation and conduit installation, which could be added to the County construction contract. The completion of the cost estimate is essential for the next meeting scheduled in February 2004.

- Rockland County will pay for the differential cost of relocating utilities underground on New Hempstead Road between Little Tor Road and Main Street.

- Jim Tannhauser from O&R noted that service to homes and businesses are difficult to construct when utilities are underground. Joe Pyzowski noted that the County would pay for the reconstruction of secondary service connections to properties on New Hempstead Road between Little Tor Road and Main Street. Most of the properties within this area include the Rockland County Facilities. Joe Pyzowski also noted that it is allowable to construct transformers on Rockland County property if necessary, and further coordination is required regarding designating appropriate locations.

- Installation of utility equipment on poles with ornamental features, as opposed to wooden poles, is not recommended.

- Jim Tannhauser noted that a distance of 1,500ft is usually required to justify installing utilities underground, a length that is satisfied on New Hempstead Road between Little Tor Road and Main Street.

Item 0002

- Bernie Kalus presented a possible construction staging scenario for the proposed work within the Phillips Hill area between Phillips Hill Road and Colonial Drive. The proposed work includes the construction of parapet walls on both sides of New Hempstead Road, with the addition of temporary pavement on the north side with steel sheet piles for embankment support. The staging would require the utility poles to be relocated behind the steel sheet piles. The staging scheme shows the possible locations for the relocated utility poles. Copies of the drawings showing the staging scheme will be sent to the utility agencies.

- Jim Tannhauser noted that the there is triple circuit from the Palisades Interstate Parkway to John Street. He also noted that relocating a triple circuit underground is not preferred.

- Joe Pyzowski noted that the option exists to attach the relocated utilities to the proposed parapet wall.

- The utility agencies noted that it is easier to relocate poles in one long stretch, incorporating the entire New Hempstead Road corridor as opposed to relocating poles in sections which would minimize the total number of splices required.

- The relocation of overhead utility lines will not be restricted by the installation of steel sheet piles because the piles will be cut close to grade.

- Bernie Kalus asked the utility agencies if there are any specific general provisions required for relocating utilities because the Contractor will have the option to modify the staging (with the Counties approval) developed by the designer.

Item 0003

- Kevin LaGreca of the Sells/PB Joint Venture (Consultant) presented a typical, two-lane maintenance and protection of traffic scheme proposed for the reconstruction of New Hempstead Road between the Palisades Interstate Parkway and Little Tor Road. The scheme suggests placing temporary pavement on the north side of the roadway in order to get the required width of roadway that would allow two lanes of traffic and one lane of construction. As a result, the poles on the north side of New Hempstead Road from will require relocation prior to construction. The final pavement width will be less then that with the temporary pavement, therefore the new pole locations would be further away from the final pavement. Copies of the drawings showing the staging scheme will be sent to the utility agencies.

- The utility agencies were concerned whether or not there is sufficient right-of-way for the pole relocations. Bernie Kalus noted that the existing New Hempstead Road right-of-way is irregular. Because of the proposed widening of the roadway, additional right-of-way takings are required in some locations and will accommodate the relocated poles.

- It is not necessary to relocate underground duct banks throughout the entire New Hempstead Road corridor unless a specific conflict occurs with the proposed design.

4. Special considerations by the Consultant should be made during the drainage design as not to conflict with existing underground utilities.

5. Joe Pyzowski noted that he would like to have the overhead utilities go underground on Main Street near the courthouse lawn. The location of riser poles will be discussed in the next meeting scheduled for February.

6. Kevin LaGreca will send a letter and drawings (staging plans and utility plans with poles and pole numbers) to the utility agencies.

   Joe Pyzowski noted that construction work might commence in spring, 2006. The construction schedule will incorporate the time required to relocate the utilities.

7. The utility companies will provide sketches next meeting depicting their anticipated locations for the relocated utilities, which would help develop completed maintenance and protection of traffic plans.

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MEETING AGENDA
UTILITY ISSUES

The purpose of the meeting is to discuss the open items from the initial utility meeting held on August 28, 2003 and initiate a bi-monthly schedule of utility coordination.

1. Open Issues from Last meeting

ITEM	DESCRIPTION	STATUS	START	DUE	BALL IN COURT
00001	Funding for utility relocation work was brought up by Verizon. It was questioned whether or not the County would be paying for both the underground installations and overhead relocation of lines. The County stated that the additional cost associated with installing facilities underground in the downtown area would be reimbursed to the utility companies. In other words between Little Tor Road and North Main Street the companies would be responsible for the costs that would have been incurred to adjust the aerial facilities to a new above ground location but would be reimbursed for incremental cost increases to reconstruct underground. The costs for all other relocations made necessary by the project are the responsibility of the utility owners.	Open	8/28/03		RCHD
00002	It was noted that with the anticipated need for retaining walls with safety barriers, the area of Phillips Hill Road would be of concern for pole relocations. As such, underground relocation in this area may be necessary. Mr. James Tannhauser of Orange and Rockland stated that three electric circuits run through this area and it would not be possible to relocate that underground. Orange and Rockland will determine the extent of where the three circuits are located and will report back to the County.	Open	8/28/03		O&R
00003	MPT is a concern particularly due to full depth reconstruction. It is desirable to have utilities perform their work prior to roadway construction to take full advantage of shifting traffic to the shoulder areas.	Open	8/28/03	12/16/03	Sells/PB
Next open item will be 00004. All open items will be carried through on the meeting minutes.					

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2. Aerial Relocations in Rural Section
    a. Design provisions
    b. Special circumstances
        i. Restrictions between June and September
    c. Tree trimming provisions
3. Design of Underground Utilities in Urban Section
    a. Funding
    b. Design issues
        i. Switches, transformers
        ii. Minimum distance to consider underground installations
    c. Schedule
4. Maintenance and Protection of Traffic
    a. Typical staging scheme
    b. Philips Hill area
    c. Required up-front activities

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MEETING MINUTES

Date: September 7, 2004

Time: 9:00A.M.

Place: Rockland County Highway Department
23 New Hempstead Road
New City, NY 10956

Project: New Hempstead Road Reconstruction:
Palisades Parkway to Route 304
PIN 8755.23, RC3273 (PB 26533 CHS 01007)

Purpose: Utility Meeting

Attendance:

Joseph Pyzowski	Rockland County Highway	845-638-5060
Jared Anderson	Sells/PB Joint Venture	914-747-1120
Bernie Kalus	Sells/PB Joint Venture	914-747-1120
Kevin LaGreca	Sells/PB Joint Venture	212-631-3859
Shirley Mcleod	Verizon	914-241-8371
Ed Casey	Verizon	845-354-5426
Ralph Quintero	Verizon	845-354-5006
K. Luke Kalarickal	Clarkstown Sewer	845-638-2111
Tanyo Parashkevov	United Water	845-623-1500
Fred Clark	Orange&Rockland Gas	845-577-3305

Documents Exchanged at Meeting:

1. No Documents were exchanged in the meeting.

2. Updated New Hempstead Road design drawings have been sent to each utility agency for their review on August 12, 2004. The updated drawings show the following:

   - Proposed New Hempstead Road horizontal and vertical design
   - Updated existing utility locations as a result of test pit data
   - Conceptual layout of the proposed utility relocations, which have been highlighted for each utility agency to review

Meeting Discussion:

1. Bernie Kalus from Sells/PB briefed the attendees of the project status. The briefing highlighted the alignment horizontal and vertical changes which may impact the existing utilities. The new

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pavement structure thickness will be approximately 2-feet thick.

2. Telephone:
   - Verizon confirmed that horizontal sweeps for the underground telephone conduit in order to avoid relocated pole locations or proposed drainage structures are feasible.
   - Underground telephone conduit will require relocation or sweeps in areas where the roadway profile is lowered, utility poles are located, or proposed drainage facilities are required.
   - Verizon confirmed that horizontal sweeps are possible for the telephone conduit. Verizon will check if vertical sweeps are feasible in areas in which the roadway profile is to be lowered.
   - Verizon mentioned that they may upgrade the underground telephone in the downtown area.
   - Verizon and O&R are coordinating utility pole relocations.
   - Verizon asked about the required clearing and grubbing in order to relocate the utility poles. The Rockland County contractor responsible for the reconstruction of New Hempstead Road will provide clearing and grubbing early in the project construction stage.
3. Gas:
   - The test pits revealed that the high pressure main and gas main near Buena Vista Road are switched in location in relation to record drawings. They have also revealed that the high pressure gas main is about six feet deep and will not be impacted by the New Hempstead Road construction.
   - Fred Clark of Orange & Rockland mentioned that a sand cushion is required above gas mains and high pressure pipe. In addition, he mentioned that 24-inches minimum of cover is required for distribution lines.
   - The updated design drawings indicate that the gas main will require relocation in areas in which the proposed roadway profile will be lowered.
   - Fred Clark mentioned that all bare steel gas mains will be replaced with plastic. In total, there is approximately 7,000-feet of gas main replacement required for the project.
   - Orange & Rockland developed a matrix for the required gas utility relocations and will send it to Rockland County.
   - Fred Clark mentioned that contractors performing gas main relocation require specific certifications and qualifications.

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4. Water
   - Concerns for construction staging, traffic control, and fire service have been discussed. Rockland County will send a letter to the Clarkstown Fire Marshall requesting information for the potential of upgrades to the fire hydrant locations.
   - The proposed drainage may impact the service connections. Joe Pyzowski had mentioned that it would be easier to have an item in the Rockland County contract to relocate water utilities, including their service connections.
   - Tanyo Parashkevov of United Water estimates that approximately 80-feet per day of water main replacement can be achieved. Concerns for forces on the pipes during excavation were raised. The water mains require a certain amount of cover in order to equalize pressure forces.
   - Concerns for temporary loss of service during construction have been discussed. The suggested method that would eliminate such concerns involves constructing the new water main, perform wet-tap connections, and then remove the old pipe. Downtime to water service is undesirable.

     Tanyo Parashkevov provided required clearances between the relocated water main and sewer:
     - 10-feet (horizontal)
     - 10-feet (vertical) if sewer is above water main

5. Miscellaneous:
   - Construction is anticipated to begin in late 2006.
   - A letter will be sent to the utility agencies requesting that any proposed utility upgrades should be constructed before or during this project.
   - Joe Pyzowski mentioned that the utility agencies take advantage of this opportunity to provide connections for potential future services.
   - Joe Pyzowski had asked that the utility agencies provide a conservative schedule and cost estimate to perform all the work so that it can be incorporated within the overall construction schedule.
   - The next utility coordination meeting is tentatively scheduled for late October.
   - Kevin LaGreca from sells/PB will send test pit data and conceptual grading plans to United

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Water and Orange & Rockland.

- Joe Pyzowski stated that should the utility agencies wish to have the County's Consultant perform design work for utility relocations / upgrades they would have to contract directly with the Consultant. The utility agencies and / or their designers will be required to coordinate all changes with Rockland County.

- Joe Pyzowski recommended that underground utility relocations be considered for addition to the Rockland County Construction contract.

- Sells/PB will send the boring information to the utility agencies when completed. There are concerns about rock excavation for relocated utilities in areas, which the proposed roadway profile will be lowered.

Minutes prepared by the Sells/PB Joint Venture

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MEETING MINUTES

Date: August 28, 2003

Time: 8:30 A.M.

Place: Rockland County Highway Department
23 New Hempstead Road
New City, NY 10956

Project: New Hempstead Road Corridor Safety Study:
Palisades Parkway to Route 304
PIN 8755.23, RC3273 (PB 26533)

Purpose: Utility Meeting

Attendance:

Joseph Pyzowski	Rockland County Highway	845-638-5060
Steven Smith	Sells/PB Joint Venture	914-747-1120
Jared Anderson	Sells/PB Joint Venture	914-747-1120
Bernie Kalus	Sells/PB Joint Venture	914-747-1120
George Moglia	Sells/PB Joint Venture	212-465-5778
Kevin LaGreca	Sells/PB Joint Venture	212-631-3859
James Evangelisti	Verizon Engineering	914-741-7760
Ben Hemus	Verizon Engineering	914-741-8746
James Tannhauser	Orange and Rockland	845-577-3201
Tom Chase	Cablevision	845-624-3500 (x293)

Documents Exchanged at Meeting:

1. The Consultant provided the County with copies of the In-Progress preliminary plans which included profiles and typical sections.

2. The Consultant provided the utility companies with typical sections showing utility pole relocation.

Meeting Purpose

A. To provide utility owners with early insight into project impacts and initiate utility relocation/accommodation process.

B. To avoid delays experienced during the North Main Street project by increasing the involvement and coordination with the utility owners.

Meeting Discussion (see attached Agenda):

1. Joe Pyzowski, P.E., Project Manager of the Rockland County Highway Department stated that a project objective is to provide aesthetic improvements in the "downtown area" on New Hempstead Road between Little Tor Road and North Main Street. These improvements will include landscaping, pedestrian treatments, ornamental street lamps, etc. Associated with these aesthetic improvements the County and the project's Citizens Advisory Group are requesting that utility owners investigate reconstructing aerial facilities between the Sheriff's Department and North Main Street, underground. Additionally, significant aerial relocation will be required within the remaining project area west of Little Tor Road to the Palisades Interstate Parkway.

2. Bernie Kalus of the Sells/PB Joint Venture gave an overview of the project for the utility companies. Mr. Kalus explained that the intent of the project was to perform full depth reconstruction with widening throughout the New Hempstead Road corridor and perform profile readjustments at Phillips Hill Road, the 'S-Curve' and for the bridge over Demarest Kill near North Main Street. Mr. Kalus also described the proposed intersection improvements at Little Tor Road and North Main Street and the aesthetic enhancements in the Downtown Section (Little Tor Road to North Main Street).

3. The following summarizes the discussions and conclusions reached with the utility company representatives.

- Utility company representatives felt that utility pole relocations are of concern depending on the limits of sidewalk installation, given the need for pole clearance to roadway edges and trees, and the limited right-of-way that is available.

- Funding for utility relocation work was brought up by Verizon. It was questioned whether or not the County would be paying for both the underground installations and overhead relocation of lines. The County stated that the additional cost associated with installing facilities underground in the downtown area would be reimbursed to the utility companies. In other words between Little Tor Road and North Main Street the companies would be responsible for the costs that would have been incurred to adjust the aerial facilities to a new above ground location but would be reimbursed for incremental cost increases to reconstruct underground. The costs for all other relocations made necessary by the project are the responsibility of the utility owners.

- Verizon had noted that a pole will need to be placed on each side of the underground utility run in order to connect to the aerial utilities.

- It was noted that with the anticipated need for retaining walls with safety barriers, the area of Phillips Hill Road would be of concern for pole relocations. As such, underground relocation in this area may be necessary. Mr. James Tannhauser of Orange and Rockland stated that three electric circuits run through this area and it would not be

f.1/c

Coyle & Coyle, Inc.

REAL ESTATE APPRAISER & CONSULTANTS

40 South Main Street, New City, NY 10956

Via E-Mail: J.Simoes@clarkstown.org

September 19, 2011

RECEIVED
SEP 20 2011
TOWN PLANNING DEPT.

Mr. Joe Simoes
Town Planner
Town of Clarkstown
10 Maple Avenue
New City, NY 10956

Re: Review of Residential Property Value and Impact Study of Proposed O & R Electric Transmission and Gas Regulator Substations at the Intersection of Little Tor Road and South Mountain Road

Dear Mr. Simoes:

At your request, we have reviewed the captioned report which was prepared on November 16, 2009 by Beckmann Appraisals Inc. To begin, we will briefly summarize the purpose of the Beckmann Appraisals report.

As depicted on page 1 of the Beckmann report, in its Executive Summary, it states the following:

> *"We have been requested to offer our opinion as to the potential impact on the value of nearby properties to the proposed Little Tor Road/South Mountain Road electric utility substation and a gas regulator substation. ... In reviewing the assignment we realized that we would be employing a significantly large set of data, single family residential sales each of which was delineated by the significant attributes of the property sold. Accordingly, we have utilized a*

geographic information system (GIS) as well as multiple regression analysis, a statistical tool using computer aided software that enables an appraiser to employ a larger amount of data and variables than typical.

We located two substations that were in reasonably sub-markets, although not identical in locational attributes to the subject property proposed substation, the New Hempstead Road/New City substation and the Congers substation. The New City substation and its attendant high tension wires are located at the southbound exit/entry to the Palisades Parkway Exit 11. New Hempstead Road is a busy two lane road that is the primary east-west link to and from New City. The New Hempstead substation sub-market is highly residential, although it is somewhat intermixed with a variety of religious uses. It is within the East Ramapo Central School District. There is a small strip center, also, in this area which we do not consider a significant influence on neighborhood values. We deemed this site substantially and reasonably similar in many market/locational attributes. The other substation that is also within a similar residential sub-market area is the Congers substation located off Gilchrest Avenue along the railway line west of Congers Lake and Route 303...

For purposes of this report we are using a well-recognized statistical method, a Multiple Regression Analysis (MRA) technique, which involves the (linear) correlation of value-influencing attributes to changes in sales prices...

We have also reviewed the literature in the field that discusses the influence of the presence of power lines on adjacent and nearby properties. There are no such articles with respect to substations; however, there are many aspects of high tension wires that are similar to electrical or gas substations, although with greater visibility. The studies consistently find that to the extent that there is any value diminishing influence of the presence of power lines that the greater the distance from the line the less the value influences. Further, they find that over time this negative influence on value diminishes. The literature, therefore, is consistent with our studies as both the New Hempstead Road – New City substation and the Congers substation have been present for a very long time. Simply put, people got used to them and did not find over time that they reduced the value of their houses upon sale.

We consider that the subject proposed substation site is an already existing impacted site, as described above. It is similar to the sub-markets we studied. Further, the existing gas regulator is proposed to be moved from its current site to one further removed from adjacent properties. We also apply our experience as appraisers from which we know that with respect to an already impacted site the addition of a potential negative externality has a limited probability of decreasing nearby property values. We also know that if a site is large, is well protected by visual barriers such as trees and other vegetation

so that there is limited visibility to adjacent or nearby property owners, that the potential to reduce lower property values is diminished. Accordingly, we conclude that the subject proposed substation is unlikely to reduce nearby property values."

To summarize the Beckmann report, the subject property is already impacted by high tension wires which are adjacent to the subject property. In addition, there is a gas regulator on site. To determine if there is any impact by the proposed improvements to the subject site, the Beckmann report provided a multiple regression analysis. Two other substation locations in Clarkstown were found and identified. One was located in the New Hempstead Road / New City area and the second one was located on Gilchrest Road in Congers.

For each of these substation locations, the Beckmann report identified residential sales which occurred within 2500 linear feet of the substation. The sales were studied from January 2005 through September 2009. For the New Hempstead Road / New City substation, 56 sales were identified within 2500 feet. For the Congers Substation, the same time period of residential sales and distances was used and 62 residential sales were identified. Some sales in each data set were removed if they lacked certain information or located along a busy road such as New Hempstead Road or Route 303. The key comparison factors for the multiple regression analysis are as follows:

1. Date of sale
2. Square feet of living area
3. Lot size
4. Number of baths
5. Whether or not there is a garage
6. Whether or not there is central air conditioning
7. Number of bedrooms
8. Whether or not the house has a basement
9. Architectural style of house
10. Whether or not the property is adjacent to existing powerlines
11. **Whether or not the property is within 500 feet of the substation property line**

As noted on page 13 of the Beckman report, the following is stated:

"The distance variable is the one of most interest in this study, as it is designed to capture any impacts of proximity to the substation (S). Because the distant variable is a yes/no (or qualitative) variable, this specification will produce an estimate of any difference in selling prices between properties inside and outside of 500 feet from the substation (S), while controlling for the price impact of the other variables in the model."

By having this study of 56 and 62 residential sales within 2500 feet of an existing substation, the Beckman report specifically concentrates on sales that are within 500 feet of the substation and how this particular factor affects values through the multiple regression analysis. After performing this analysis, the Beckman report finds that the sampling of sales does not show any discernable impact on value for those properties near a substation.

The following are our comments and concerns for each of the Beckmann study areas, beginning with the New Hempstead Road / New City data.

1. As depicted on page 30 of the Beckmann report, 56 residential sales were utilized that were within 2500 feet of the substation. Of these 56 sales, 6 sales (Sales 51 through 56) are within 500 feet of the substation. However, Sales 52 and 54 are repeats of the same sale. Therefore, only 4 sales are within 500 feet of the substation. In our opinion, 4 sales within 500 feet of a substation does not appear to be a large enough set of data to provide any substantial results.

2. In the Beckmann report, the qualifying distance is that the property is within 500 feet of a substation. As noted in the Appraisal Journal article for the Summer of 2009, it states the following:

   "where effects are found, they decay rapidly as distance to the lines increases and usually disappear at about 200 feet to 300 feet. (61 meters to 91 meters)."

   The 2nd study cited by the Beckmann report is the Appraisal Journal, Fall of 2007, which states a similar distance impact factor which is as follows:

   "these impacts (referring to high tension power lines) *diminish as distance from the line increases and disappear at a distance of 200 feet from the lines."*

   In the case of the subject, the substations can only be seen from a very limited distance. Since the Beckmann report uses 500 feet as the qualifying distance, the results might be skewed by the greater distance. It may be better to revisit substation sales and confine the distance of the sales to within 300.

3. The Beckmann report cites residential sales from January 2005 through September 2009. This was a highly volatile timeframe in regards to changing property values. We're not sure how changing values over time are handled by the Beckmann report.

4. 4 Hoover, which is within 500 feet of a substation, is somewhat mischaracterized by the long access driveway of the substation. The New Hempstead Road / New City substation has a long and narrow access road from New Hempstead Road. This access road is over 400 feet in length. This sale is over 500 feet from the substation improvement, but within 500 feet of its road access. (Refer to the distance map attached.) We are not sure that this measurement including the access road properly accounts for the real location of this substation.

The following are our comments regarding the Congers substation analysis:

1. Like the New Hempstead Road / New City analysis, there were a total of 62 sales with 4 within 500 feet of the substation. Again, having 4 sales within 500 feet of the substation may not be a large enough sampling to properly identify value changes during the 2005 to 2009 timeframe.

2. The Congers substation is directly adjacent to an active railroad line. All of the sales within 2500 feet of the substation are also affected by the presence of the railroad tracks. Two of the 4 sales within 500 feet of the substation (229 South Harrison Avenue and 14 Gilchrest Road) are directly adjacent to the railroad tracks. Our concern is that any value effects due to the substation may be overshadowed by the effects on value for this entire area by the active railroad tracks.

3. As noted on page 23 of the Beckmann of the report, Sales 24 through 27 are within 500 feet of the substation. However, upon visiting each of these 4 sales, we note that Sale 25 at 2 Von Beaste Lane is more than 500 feet from the substation. (As the crow flies, it's over 800 feet from the substation. Refer to the distance map attached.) Further, the sales price for 2 Von Beaste Lane is depicted as $440,000 in the Beckmann report. However, the actual recorded Deed price is $452,410. The difference between the two numbers should be clarified.

Final Conclusion

In conclusion, there are very few sales (7 sales) within 500 feet of a substation. Further, 4 of the 7 sales may be overshadowed by the presence of the active railroad line near the Congress substation. As previously mentioned, the Congers substation set of data may be misinterpreted due to the presence of an active railroad track. For the New Hempstead Road / New City set of data, only 4 sales (at best) are within 500 feet. The small number of sales may limit the reliability of performing a multiple regression analysis with only 4 (at best) controlled sales.

On the other hand, a multiple regression analysis is the least objective approach and is the only approach to give explicit measures of reliability.

Based on the review of the Beckmann report as well as other published literature within the appraisal field, it appears that the proposed substation for the subject property would likely have little impact on value for many of the surrounding properties. However, the appraisal literature does cite that properties may be impacted if they are within 200 to 300 feet. Further than 300 feet from the negative influence, the literature as well as the multiple regression analysis performed by Beckman indicates little to no lasting diminution in value.

Respectfully submitted,

Gregg Manzione, MAI

James Coyle, Pres.

GM/ac
Attachments

E-MAILED TO M. LEIFER
11/18/11

ENERTECH Consultants
494 Salmar Avenue, Suite #200
Campbell, California 95008
(408) 866-7266 FAX : (408) 866-7279
WWW.ENERTECH.NET

To: Honorable Shirley J. Thormann, Chairperson

From: Enertech Consultants

Date: November 16, 2011

Re: Comments from Morton Leifer Regarding Magnetic Field Modeling Assessment for the Little Tor Substation

Dear Ms. Thormann,

Enertech has reviewed the letter submitted on October 17, 2011 by Mr. Morton Leifer concerning the Modeling Assessment for the Little Tor Substation which we prepared for Orange & Rockland. This letter was prepared to address the comments which Mr. Leifer raised concerning this report.

Mr. Leifer states that he conducted magnetic field measurements under the existing 138 kV transmission lines, where he measured values from 3 to 75 mG. Our computer modeling of the existing electrical facilities shows a calculated peak magnetic field under the 138 kV transmission line of 74.5 mG (Section 4.3, page 6, paragraph 4 and Figure 8, page 10). So his measurements and our modeling compare closely to one another.

Mr. Leifer also conducted magnetic field measurements under the existing 13.2 kV distribution lines along North Little Tor Road and South Mountain Road, where he measured values in the 75 mG range. Our computer modeling of the existing electrical facilities did not include these existing 13.2 kV distribution lines. Therefore, there are no calculated values with which to compare with his measured values.

Mr. Leifer states that the magnetic field from the four proposed 13.2 kV underground lines can be significant, and coupled with the overhead lines, can represent an environmental issue for the area that must be more carefully considered. Our computer modeling of the proposed electrical facilities does include the four 13.2 kV underground distribution circuits as routed out of the proposed substation and onto North Little Tor Road. Calculated magnetic field values at 1–meter height directly above the four 13.2 kV underground distribution circuits is 32.7 mG (Section 5.3, page 15, paragraph 3 and Figure 15, page 18).

Mr. Leifer states that the report provides no specificity as to where these underground 13.2 kV lines will be located, their paths, and extent into the surrounding area. However, the underground distribution line route to North Little Tor Road is shown in Figure 13 (page 17) and Figure 16 (page 19). Due to the complexity of Figure 13 and the size of Figure 16, it may be difficult to determine the location of the underground distribution line route; therefore, an enlarged version of Figure 16 is shown below (Figure 16A).

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To clarify this discussion regarding the existing overhead distribution lines and the proposed underground distribution lines, it is reported by Orange & Rockland that the existing distribution line configurations will not change with the addition of the Little Tor Substation (i.e. the existing distribution lines along North Little Tor Road and South Mountain Road will remain the same regardless of whether the proposed substation is constructed or not). Since electrical power is presently being provided by other nearby substations, the proposed Little Tor Substation would only act as a new source for the same level of electrical power that presently exists. The four proposed 13.2 kV underground distribution circuits as routed out of the Little Tor Substation simply connect the substation to the existing (unchanged) overhead distribution line system. These interconnecting circuits are proposed to be located underground (rather than overhead) for aesthetic and exposure reasons. One 13.2 kV underground distribution line would connect to the existing overhead distribution line system (at South Mountain Road) via a riser pole within the substation property, a second underground line connects via a riser pole at the substation property line (at North Little Tor Road), and the remaining two underground lines are routed adjacent to North Little Tor Road to connect into the existing overhead distribution system at the southeast corner of the substation property (to avoid conflicts with an existing 34.5 kV overhead circuit). Although the load flow pattern of the overhead distribution system may change (due to the change in the source location of the electrical power), no additional electrical load will be added to the overhead distribution system as a result of constructing the Little Tor Substation.

Finally, Mr. Leifer requests that a more in-depth study of the proposed underground distribution lines and their associated equipment, such as electrical transformers, should be undertaken and specific details provided as part of the Environmental Impact Statement. Associated equipment, such as electrical transformers, are already modeled as part of the internal substation equipment which Mr. Leifer agrees with and reasonably concludes that there would be negligible magnetic field outside of the substation property line. The four 13.2 kV distribution lines themselves are modeled with their proposed routes and their associated magnetic field levels been calculated and reported.

Respectfully Yours,

Enertech Consultants of Santa Clara County, Inc.

ENERTECH Consultants
494 Salmar Avenue, Suite #200
Campbell, California 95008
(408) 866-7266 FAX : (408) 866-7279
WWW.ENERTECH.NET

To: Honorable Shirley J. Thormann, Chairperson

From: Enertech Consultants

Date: November 16, 2011

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Respectfully Yours,

Enertech Consultants of Santa Clara County, Inc.

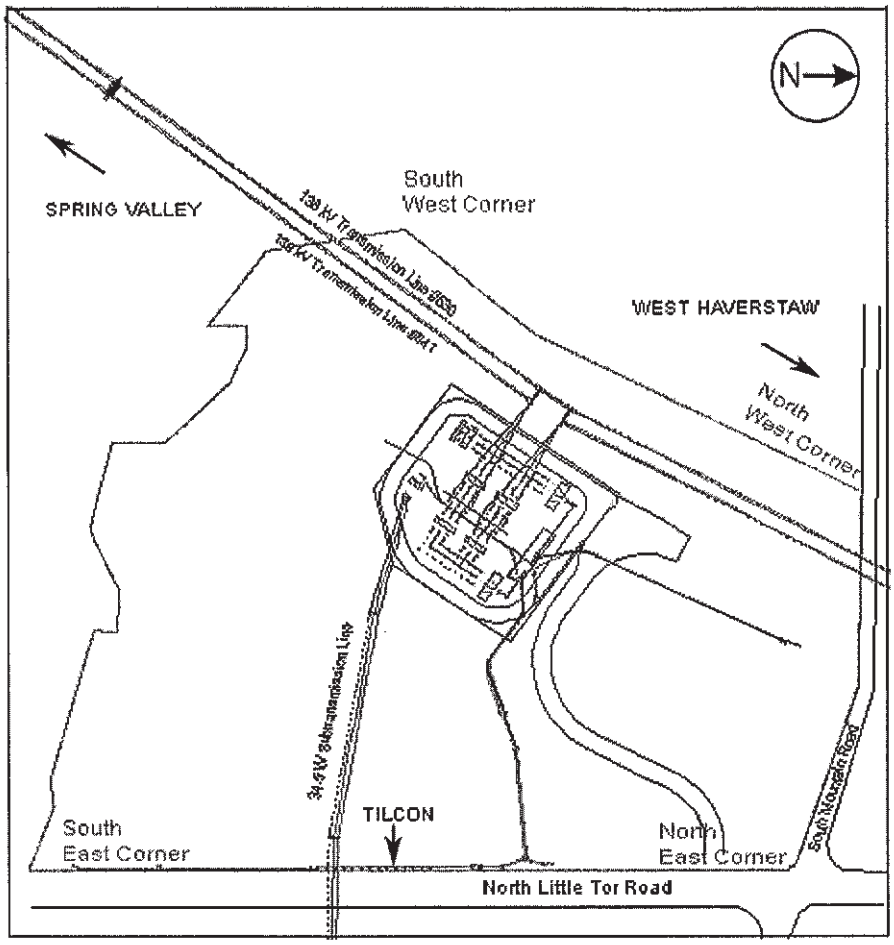

Figure 16A. Diagram of Property Line Path for Magnetic Field Calculations
(Proposed Substation)

MORTON LEIFER PE.

ELECTRONIC COMMUNICATIONS SPECIALIST

TOWN OF CLARKSTOWN

X ST, X JS, X JE, X DC, X AT, X OTH, X Mark Willes (fax), file

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To: Honorable Shirley J. Thormann Chairperson
Honorable Members of the Clarkstown Planning Board
From: Morton Leifer
Date: October 17, 2011
Re: Magnetic Field Modeling Assessment for the Little Tor Substation.

Dear Ms. Thormann,

I have carefully reviewed the Draft Environmental Impact Statement submitted on behalf of Orange & Rockland Utilities Inc. that was prepared by Enertech Consultants of Santa Clara Inc. of Campbell, California.

The report posits that "The New York Public Service Commission standard requires magnetic field levels at the edge of a transmission line right-of-way to be under 200 mG at maximum load. Calculated magnetic field levels for all of the transmission line and distribution line circuits associated with this project are below this 200 mG standard".

Computer modeling of the magnetic fields around the perimeter of the proposed substation convincingly demonstrate that the magnetic fields due to the proposed construction of the substation's electrical equipment will produce significantly less than 200mG at the perimeter of the proposed substation.

The electrical transformers and associated switchgear will not be located near the perimeter of the substation. The distance of the electrical equipment to the perimeter of the substation will reasonably attenuate the magnetic fields to the calculated levels of 2 to 3 mG. The additional distance from the substation perimeter to the property lines will further reduce the magnetic fields to the calculated values of 0.2 – 0.3 mG.

In summary, there would likely be no increase of magnetic field levels at the perimeter of the property due to the installation of the proposed transformers and switchgear within the substation.

I must point out, however, that on my visit to the property I measured the levels of magnetic field along the property line to be anywhere from 3 to 75 mG, the higher value due to the existing 138 KV transmission lines. These levels would persist along the right-of-way of the transmission lines far distant from the proposed substation. I also measured magnetic field values in the 75 mG range all along the 13.2 KV distribution lines that are ubiquitous on N. Little Tor Road and South Mountain Road. The magnetic field from these 13.2 KV distribution lines is strong because they are much closer to ground level than the 138KV transmission lines.

20 Maple Avenue New City New York 10956 845-406-0729 m_leifer@town.clarkstown.ny.us

While I believe there is no issue with the 34.5kV sub-transmission line to Tilcon, because there is a well-defined and existing right-of-way that can be easily seen and avoided by pedestrians, I am troubled by the four proposed 13.2KV underground distribution lines.

The report forecasts significant current loads for these underground distribution lines. They are not buried deeply and are therefore much closer to the ground level than the elevated 13.2 KV distribution lines mounted on the telephone poles. The magnetic field from the underground 13.2 KV lines can be significant, and coupled with the overhead lines can represent an environmental issue for the area that must be more carefully considered.

The report provides no specificity as to where these underground lines will be located, their paths and extent into the surrounding area.

I understand that the primary purpose of building the substation is to provide additional electrical capacity to the area. The proposed four 13.2 KV underground distribution lines are necessary to accomplish that.

With regard to magnetic fields, the focus of the report has been almost entirely on the electrical equipment proposed to be built within the substation. The report reasonably concludes that there would be negligible magnetic flux density outside of the property lines due to the electrical transformers and associated switchgear.

The primary environmental effect on the community with regards to increased magnetic field exposure is, in fact, the proposed four underground 13.2 KV distribution lines and their associated electrical equipment. The report should include details of where the lines would be located, what magnetic field mitigation would be implemented and what signage would be used to keep people from unknowingly congregating in areas of high magnetic flux density.

Underground 13.2 KV distribution lines are used in many neighborhoods in Clarkstown. They are, however, rarely used where there is such a high density of overhead electrical distribution lines already in existence.

I believe a more in-depth study of the proposed underground distribution lines and their associated equipment, such as electrical transformers should be undertaken and specific details provided as part of the Environmental Impact Statement.

Respectfully submitted,

Morton Leifer

Morton Leifer PE.

Subject:	**O & R Scoping Session Transcript Question**
From:	rgeneslaw@aol.com
Date	Tuesday, March 05, 2013 4:46 PM
To:	fuadib@applemon.com

Good Afternoon Fuad, Upon our review of the O & R transcript, we would like you to explain your comment to us in lay terms so I can add it to the scope. Thank you. Bob Geneslaw

MR. ADIB: Good evening. My name is Fuad Adib. I talked several times in the past. I'm a professional engineer of the State of New York.

I reviewed the document, I didn't see anything about dissolved phase organics transporting into well water. I can understand that oil water separator might receive or might remove some of the oil which is dissolved, undissolved filtration, but the dissolved components which would vibrate the well water people who drink from those wells is not dissolved. Thank you.

Robert Geneslaw Co.
Planning and Development Consultants

Robert Geneslaw, AICP
368 New Hempstead Rd #320
New City, NY 10956
Office (845) 368-1785
Fax (845) 368-1787
RGeneslaw@aol.com

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Subject:	**Re: O&R Proposed Substation**
From:	rgeneslaw@aol.com
Date	Sunday, June 24, 2012 9:39 AM
To:	Fuad Adib

Mr. Adib, Thank you for the correspondence. I have rearranged my schedule and will be in attendance Wed. evening for the O & R Public Scoping Session. I looked over your items and hope you are present at the Wed meeting to present them, as they seem relevant to the Scoping of the Supplemental DEIS (SDEIS). O & R is the 4th item on the agenda, however the meeting is starting at 7pm. Thanks. Bob Geneslaw

Robert Geneslaw Co.
Planning and Development Consultants

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In a message dated 06/23/12 22:58:36 Eastern Daylight Time, fuadib@applemon.com writes:

Dear Mr. Geneslaw,

Following please find a summary of my comments related to the deficiencies of the project's DEIS submitted by O&R to be addressed in the supplemental DEIS:

1. DEIS Structure: The existing DEIS (DEIS) is a flat compilation of many documents. The needed information cannot be easily found and reviewed. Crucial information may be overlooked. I request that the supplemental DEIS should have a 2-page Executive Summary that offers the crucial information requested by the public and discussed later in sections. The less relevant documents like a 500-page database search should go to appendix.

2. Justification of Need: DEIS did not include specific justification as to why the substation is necessary instead had general reference that consumption has increased. O&R should provide specific information like " Property X with electric consumption amount of Y is added to the system. Therefore the substation is necessary".

3. Oil Storage: DEIS did not include the amount of oil handled/kept at the site. It is crucial that the public knows this amount.

4. Geocomposite Material: DEIS did not reveal the type and specification of the geocomposite material.

5. Construction Details: DEIS did not provide a plan with sections

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showing the foundation structure of the transformers, the protective layers, etc. instead several electrical drawings were provided that could not be used for understanding the project specifics.

6. Release of Contaminants: According to USEPA and NYSDEC, Water Quality in Clarkstown is considered worst than national average due to more than national average contaminated sites within Clarkstown that release dissolved phase contaminants to groundwater or surface waters. Given the positive exposure of the facility to precipitation, DEIS does not include protective measures against transport of dissolved contaminants from the site to surface waters and groundwater. It discusses several physical barriers, none capable of withholding dissolved pollutants.

7. Fires: The substation contains 3 hazardous elements namely gas, electric and oil. Within the life span of the substation, at least one fire is likely to occur. DEIS does not discuss the protective measures against spread of fire in a densely wooded area instead it relies on local fire control facilities.

8.Electromagnetic Field: DEIS does not have an assessment of the health stress in the communities around substations instead declares that EMF levels are below state threshold. DEIS should recognize that even perception of danger is a serious factor causing unease in the population.

I appreciate the opportunity of providing you my comments.
--
Regards,

Fuad F. Adib, Ph.D., P.E.,
Applemon Corporation
151 South Mountain Rd
New City, NY 10956
Phone: (845) 634-0858
Fax: (845) 634-7398
Cell: (845) 367-1917

Visit us at www.applemon.com

Subject:	**Re: O & R Scoping Session Transcript Question**
From:	rgeneslaw@aol.com
Date	Wednesday, March 06, 2013 1:44 PM
To:	Fuad Adib

Thanks. We had to respond with changes before receiving your recent E-Mail but we reviewed some sources online and gleaned the explanation and we were able to add to the Scoping Outline. Bob

In a message dated 03/06/13 13:41:03 Eastern Standard Time, fuadib@applemon.com writes:

> Dear Bob,
>
> Thank you for considering my comment during the O & R Scoping session.
> Here is a summary explanation of the comment.
>
> Hydrocarbons including mineral oil, that is proposed as cooling liquid
> of the O&R transformers, are generally considered insoluble in water
> since they do not readily mix and dissolve in water. Therefore, to separate them from oil a simple oil/water separation is often considered
> an acceptable method for isolation and removal of the oil from water
> streams. However, despite general immiscibility with water, small
> quantity of oils are actually dissolved in water. It is this dissolved
>
> phase organics that is often subject of regulations by EPA or NYSDEC in
> fresh waters since it cannot be easily separated and removed, and can
> travel long distances with water stream. Additionally, hydrocarbons upon
> release in the environment (i.e. soil), enter a cycle of

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transformations
the result of which is that they eventually dissolve in water and leach into the aquifers (groundwater reservoirs).

For example, state DEC has determined that the whole aquifer beneath Manhattan is contaminated by dissolved pollutants to the level that it may not be used for drinking or washing.

The proposed O&R substation is located in an area where both surface water and groundwater are being used for domestic use. All houses around
the substation are on private wells and Hackensack River that is a source of drinking water runs to the south of the location. It is reasonable to assume that any release of hydrocarbons that proceeds to contact with waters including rain, streams or seepage into groundwater,
will inevitably add to the level of dissolved pollutants in the potable waters throughout the area. Since treatment of such waters is not feasible or possible, it should be concluded that the transformers should be placed in a facility that potential releases of oil from them do not come in contact with any water including stormwater, surface streams or seepage to groundwater.

I hope you find my explanation useful. Please do not hesitate to contact

me if you need further elaboration. Once again, I thank you for considering the community concerns.

Regards,

Fuad F. Adib, Ph.D., P.E.,
Applemon Corporation
151 South Mountain Rd
New City, NY 10956
Phone: (845) 634-0858
Fax: (845) 634-7398
Cell: (845) 367-1917

P.B. Mtg.
6/13/12

WEST BRANCH CONSERVATION ASSOCIATION

100 South Mountain Road New City NY 10956 voice: 845 634-3231 email: info@west-branch.org

Martus Granirer, President
Terri Thal, Treasurer,
Jan Connor, Secretary

Dear Neighbor -

Tomorrow evening, Wednesday, June 13th, at 7:30 pm in Room 311 of the Clarkstown Town Hall, the Planning Board will hold the third and final installment of its review of Orange and Rockland's Draft Environmental Impact Statement (DEIS) about the effects of the proposed substation on South Mountain and Little Tor Roads will be held. We urge you to attend.

O&R has maintained electric substations on 3.5 acres of the 10-acre site. The proposed expanded electric substation and a gas line substation will occupy much more of that land. The electric substation will comprise three new transformers, some switching gear and cabinets, and several towers. One tower will be 93.5 feet high; another will be 85.9 feet high.

Your neighbors are concerned that the substation will be ugly, noisy and dangerous. The dangers arise from the possibility that fluids in the proposed oil-cooled transformers may cause intense fire or poison the watercourse. (That stream helps to fill the reservoir that holds our drinking water.) Paste the following URLs into your browser to see videos of fires at substations. http://youtu.be/WkDCS8xeobg http://youtu.be/pdDolznk9eY

The other danger is electromagnetic force (EMF) radiation from the substation's electrical equipment and the existing overhead power lines.

O&R has released estimates of the amount of EMFs that will be emitted within its own property, but offers no information on off-site radiation. Instead, it cites the belief of a Town of Clarkstown consultant that the new equipment will yield no measurable off-site radiation.

West Branch has retained VitaTech Electromagnetics, LLC, to review that claim. Vita Tech is among the world's most reputable EMF consultants. It developed a computer model to simulate the EMFs radiating from the existing power lines, their poles and towers; and the additional EMFs that will be produced by the proposed substation. We received the report a few days ago.

It appears that some properties on South Mountain Road and Denver Drive will be — or already are—exposed to EMF radiation, ranging in force from 0.1 – 5 MilliGauss.

See the abstract of a study conducted at Oxdord University of the relationship of EMFs to childhood leukemia on the other side of this page.

Questions? Call or email.

Yours truly,

Martus Granirer, President

Terri Thal, Treasurer

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BMJ. 2005 Jun 4;330(7503):1290.

Childhood cancer in relation to distance from high voltage power lines in England and Wales: a case-control study.

Draper G, Vincent T, Kroll ME, Swanson J.
Childhood Cancer Research Group, University of Oxford, Oxford OX2 6HJ. gerald.draper@ccrg.ox.ac.uk

Abstract

OBJECTIVE: To determine whether there is an association between distance of home address at birth from high voltage power lines and the incidence of leukaemia and other cancers in children in England and Wales.

DESIGN: Case-control study.

SETTING: Cancer registry and National Grid records.

SUBJECTS: Records of 29 081 children with cancer, including 9700 with leukaemia. Children were aged 0-14 years and born in England and Wales, 1962-95. Controls were individually matched for sex, approximate date of birth, and birth registration district. No active participation was required.

MAIN OUTCOME MEASURES: Distance from home address at birth to the nearest high voltage overhead power line in existence at the time.

RESULTS: Compared with those who lived > 600 m from a line at birth, children who lived within 200 m had a relative risk of leukaemia of 1.69 (95% confidence interval 1.13 to 2.53); those born between 200 and 600 m had a relative risk of 1.23 (1.02 to 1.49). There was a significant ($P < 0.01$) trend in risk in relation to the reciprocal of distance from the line. No excess risk in relation to proximity to lines was found for other childhood cancers.

CONCLUSIONS: There is an association between childhood leukaemia and proximity of home address at birth to high voltage power lines, and the apparent risk extends to a greater distance than would have been expected from previous studies. About 4% of children in England and Wales live within 600 m of high voltage lines at birth. If the association is causal, about 1% of childhood leukaemia in England and Wales would be attributable to these lines, though this estimate has considerable statistical uncertainty. There is no accepted biological mechanism to explain the epidemiological results; indeed, the relation may be due to chance or confounding.

Comment in

BMJ. 2005 Jun 4;330(7503):1279-80.
BMJ. 2005 Jun 4;330(7503):1293.
BMJ. 2005 Sep 17;331(7517):635; discussion 636; author reply 636-7.
BMJ. 2005 Sep 17;331(7517):634-5; discussion 636; author reply 636-7.
BMJ. 2005 Sep 17;331(7517):635; discussion 636; author reply 636-7.
BMJ. 2005 Sep 17;331(7517):634; discussion 636; author reply 636-7.

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Debbie Tretola

From: Anthony Montalbano
Sent: Tuesday, June 26, 2012 4:38 PM
To: Coffey, John; Lanza, Joanne; Homenick, Michael V; Utschig, Jr., Charles W
Cc: Brian J. Quinn
Subject: FW: Comment on O&R DEIS
Attachments: O&R_Surcharge_for_New_Square_underground_lines-W-O_Banner.pdf; Letter to Clarkstown Planning Board-25_JUN_2012.pdf

FYI

Anthony Montalbano, Esq.
Montalbano, Condon & Frank, P.C.
67 North Main Street
P.O. Box 1070
New City, New York 10956
Tel.: (845)634-7010
Fax: (845)634-8993
Email: am@mcfnylaw.com

From: Martus Granirer [mailto:martusg@gmail.com]
Sent: Tuesday, June 26, 2012 4:05 PM
To: Anthony Montalbano
Subject: Comment on O&R DEIS

Tony-

I am attaching comments I submitted to Shirley Thormann and her board yesterday. After sending them, I discovered that I had omitted a section on an O&R surcharge covering the underground service it provides to New Square.

I sent the text I had omitted by email. This is what I sent:

Dear Ms Thormann:

By mistake, I left out the following from the letter I just sent to you:

1. **Costs of Undergrounding:**

O&R made a surcharge arrangement with its New Square customers to amortize the costs of placing its service to the village underground. I attach O&R's letter explaining the arrangement.

I realize that there may well be no comparison the between costs of New Square's underground installation and that required for an underground version of the North Lttle Tor Road substation, yet the costs in New Square are interesting.

In the current year, a New Square household that uses an average of 600 kWh per month will pay a surcharge of $10.66 a month or $127.92 a year.

--
-Martus

--
Martus Granirer, Lawyer
100 South Mountain Road
New City NY 10956
845 634-9700

Orange & Rockland
a consolidated edison, inc. company

Orange and Rockland Utilities, Inc.
One Blue Hill Plaza
Pearl River NY 10965
www.oru.com

March 14, 2012

Mayor Mates Friesel
Village of New Square
766 North Main Street
New Square, NY 10977

Dear Mayor Friesel:

As you know, in 2007, O&R and the Village of New Square embarked on a unique partnership that resulted in the completion of a major project to relocate an electric transmission line that ran through the center of the Village.

This project was initiated and undertaken at the request of the Village, and as a result, a 3,300 foot section of electric line that formerly ran overhead has been placed underground, and the steel transmission towers that had supported it have been removed.

All parties agreed in planning the project that a portion of the project's costs would be recovered through a surcharge on village residents' electric bills that is spread out over 40 years. This surcharge initially appeared in April 2007 as a new line item on village residents' O&R bills that is labeled: *Municipal Surcharge*. This surcharge was initially set at 1.713 cents/kWh.

The surcharge for 2012 will begin appearing in New Square customers' April bill and will be $0.01776 per kWh.

If you have any questions about this annual reconciliation of the surcharge, please call me at (845) 577-2459.

Sincerely,

Trish Austin

Trish Austin
Public Affairs Manager

Cc: Izzy Spitzer – Deputy Mayor
David Breuer – Village Clerk

2012newsquaresurchargeupdateletter

WEST BRANCH CONSERVATION ASSOCIATION

100 South Mountain Road New City NY 10956 voice: 845 634-3231 email: info@west-branch.org

Martus Granirer, President

25 June 2012

Ms Shirley Thormann, Chair, and the Members
Town of Clarkstown Planning Board
10 Maple Avenue
New City NY 10956

ORANGE AND ROCKLAND UTILITIES' DEIS FOR ITS PROPOSED NORTH LITTLE TOR ROAD SUBSTATION IN NEW CITY

Dear Ms Thormann:

1. **Preliminary**:

   A. I write to supplement my spoken comments on certain aspects of the subject DEIS.

   B. Although 23 June was the date for which you announced that these comments were due, that date fell on a Saturday. I am, therefore, following the rule of General Construction Law 25-A, and transmitting them to you today. [i]

   C. Please arrange to have copies of this letter furnished to all concerned town officials and consultants.

2. **Presentation**:

   At your 13 June meeting, Mr Letson upbraided me for not knowing that the DEIS Appendix contained material on the predicted noise impacts of the gas-handling equipment that O&R plans to install.

   Although I had read some of this material before, when I decided to re-read it after your meeting, the only way I was able to locate it was to turn from sub-section to sub-section. There was no table of contents nor any index to help me to locate what I sought.

   I urge the Planning Board to insist that detailed indexes or tables of contents be part of future amendments or supplements to the DEIS.

3. **Segmentation.**

   Segmentation of an action into components for individual review is contrary to the intent of SEQR. The segments are almost always easier to pass review.

   General. Here, the proposed construction or expansion of 21 Orange and Rockland substations is not being considered as a single action. That arrangement allows potentially serious impacts to be excluded from the review process.

For example, although substations are necessarily interconnected, the electro-magnetic fields emitted by the transmission lines that link one substation to the next are easily excluded from consideration when the substation plans are reviewed individually.

Temporary equipment. Further, allowing a "temporary" installation of equipment at the Little Tor Substation as an "emergency" measure exempt from full SEQR review is yet another form of segmentation.

This purported "emergency" arises from a need to cut over to a different source of energy a number of houses along New Hempstead Road while that road is widened. But the so-called "emergency" is the result of plans that were years old at the time the emergency building permit was sought. SEQR requires that an emergency be genuine, not the result of poor planning. I believe that the "emergency" on which the permit was premised is actually a result of poor planning. The defect is serious: the equipment now installed at the Little Tor site without environmental review has the same attributes as the permanent equipment described in the DEIS. It also presents the same risks of ugliness, noise, fire and contamination of the local aquifer and watercourses.

Gas handling equipment. The DEIS now under review mentions that the site is to be used for gas handling and distribution equipment in addition to new equipment for electric distribution. But the information on the gas-handling equipment offers nowhere near the level of detail provided for the electrical equipment. This is no minor inconsistency: the natural gas to be distributed by the new installation is highly flammable, even explosive.

The DEIS or its supplement should, at least, offer information on the dangers of the gas-handling operation and, particularly, on the possible interaction of the gas-handling operation and the electrical operation. Misadventure with natural gas entails possible danger to the electrical equipment and vice-versa.

Thank you for your consideration.

Yours truly,

Martus Granirer, Executive Director

---

[1] **§ 25-a. Public holiday, Saturday or Sunday in statutes; extension of time where performance of act is due on Saturday, Sunday or public holiday**

… When any period of time, computed from a certain day, within which or after which or before which an act is authorized or required to be done, ends on a Saturday, Sunday or a public holiday, such act may be done on the next succeeding business day and if the period ends at a specified hour, such act may be done at or before the same hour of such next succeeding business day, except that where a period of time specified by contract ends on a Saturday, Sunday or a public holiday, the extension of such period is governed by section twenty-five of this chapter.

—General Construction Law § 25-a

02 December 2008

Ms Shirley Thormann, Chairperson, and the Members
Town of Clarkstown Planning Board
10 Maple Avenue
New City, NY 10956

O & R UTILITIES, INC.: PROPOSED LITTLE TOR ROAD SUBSTATION, SL 34.05-1-6, NEW CITY

Madam Chairperson and Members:

Since 1941, West Branch Conservation Association has worked to safeguard the streams that comprise the western origins of the Hackensack River in Rockland County and the watershed that drains into those streams. West Branch endeavors to protect, as much as possible, the open, undeveloped and natural character of the area in which the proposed substation would be sited.

We have succeeded in protecting or leading others to protect almost 1,000 acres of mostly-forested open space in that neighborhood. We are sensitive to threats to the watercourses and their watershed.

The proposed project has the potential to significantly harm that watershed and one of the streams that flows through it. The harm would be done by the structures proposed for the site, by the lighting proposed for their nighttime security and by some of the equipment to be installed on it.

Background

This proposal has an unusual regulatory aspect. Two conditions that must be met for the Zoning Board of Appeals (ZBA) to grant the necessary special permit concern virtually the same attributes that you must examine under SEQR. For a public utility substation to obtain a special permit, the substation must:

1. Be "housed in a structure that harmonizes with the character of the neighborhood," and it must
2. Have adequate screening and landscaping.

Town of Clarkstown Code, Use Table 2, Column 3. (Excerpt.)

WEST BRANCH CONSERVATION ASSOCIATION

The proposed substation consists of a group of steel frames and concrete pads that would support large electrical distribution transformers and other electrical equipment, all surrounded by a chain-link fence. Nothing is to be "housed" in any structure at all, much less in one that "harmonizes" with the neighborhood.

Adverse visual effects

Whatever the ZBA may do about that discrepancy, under SEQR and its regulations, you must determine whether the proposed substation *may* have significant adverse visual effects. If your answer is "Yes," or even if it is "Maybe," you must undertake an Environmental Impact Statement (EIS).

We believe that your answer to that question should be "Yes." The applicant has provided too little information for you to make any other determination.

Although you have been given plans for plantings and screening, there is no visualization from which you can assure yourselves that the proposed screening and planting will conceal the substation, especially from the most likely public viewpoints, which are along South Mountain Road, close to the site, and from homes nearby.

Only a computer simulation—one that has been validly composed from the applicant's construction plans and from a surveyor's information on surface contours, and from plans for existing and proposed plantings at their height and density *when they are planted*—will serve that purpose.

Impacts of lighting.

A computer simulation is the only reliable way to determine the appearance of the site at night. That is important. By design and by neighborhood preference, South Mountain Road at night presents one of the few dark areas remaining in Rockland. Although the applicant has submitted drawings showing calculated foot-candle levels diminishing at increasing distances from its floodlights, it has presented you with nothing that allows you to be sure that none of those floodlights will shine in the eyes of offsite observers. No matter how distant, directly-seen light sources do not lose their intensity.

The lighting plan shows luminaries pointed *away* from the substation, their beams aimed at what may be close to horizontal elevations. Those lights may be visible offsite. No talk about shielding or screening can answer the question of whether these lights will shine where they should not. Only a computer-generated simulation can come close to answering the question.

WEST BRANCH CONSERVATION ASSOCIATION

100 SOUTH MOUNTAIN ROAD NEW CITY NEW YORK 10956 845 634-9700

Visual impacts of nighttime lighting of a proposed electrical substation sited along a semi-rural road are just as important to neighborhood character as the appearance of the substation by day.

Threat to the West Branch Stream

The substation would be partly sited on the riparian strip alongside the West Branch stream, a sub-tributary of the Hackensack River, just upstream of Lake Lucille.

The equipment to be located on the site includes a bank of distribution transformers. Typically, these transformers are oil-filled. The oil provides electrical insulation and it serves as a coolant.

Power surges, such as those caused by lightning or by switching in the grid, can burst the transformers and cause the oil to spill. Even if such events are rare, just one such spill can severely harm the watercourse and the plants, fish and animals that live in it.

No provision has been made for containing such a spill. Any such provision must take into account the possibility that the spill may occur during a downpour, when leaking oil may be flushed into the stream.

WEST BRANCH CONSERVATION ASSOCIATION

Conclusion:

Because the proposed substation will or may cause potential significant adverse visual impacts to the neighborhood and potential significant hydrocarbon contamination impacts to the watercourse, we believe that a positive declaration is warranted and that an EIS must be prepared.

Yours truly,

Martus Granirer, Executive Director

100 SOUTH MOUNTAIN ROAD NEW CITY NEW YORK 10956 845 634-9700

WEST BRANCH CONSERVATION ASSOCIATION

100 South Mountain Road New City NY 10956 voice: 845 634-3231 email: info@west-branch.org

Martus Granirer, President

25 June 2012

Ms Shirley Thormann, Chair, and the Members
Town of Clarkstown Planning Board
10 Maple Avenue
New City NY 10956

ORANGE AND ROCKLAND UTILITIES' DEIS FOR ITS PROPOSED NORTH LITTLE TOR ROAD SUBSTATION IN NEW CITY

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   C. Please arrange to have copies of this letter furnished to all concerned town officials and consultants.

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Thank you for your consideration.

Yours truly,

Martus Granirer, Executive Director

---

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—General Construction Law § 25-a

FYI:
x ST, x JS
J.-/E

Town of Clarkstown

James Creighton <j.creighton@clarkstown.org>

Correction

2 messages

Martus Granirer <martusg@gmail.com> Mon, Jun 25, 2012 at 6:28 PM
To: Shirley Thormann <s.thormann@clarkstown.org>, James Creighton <j.creighton@clarkstown.org>

Dear Ms Thormann:

By mistake, I left out the following from the letter I just sent to you:

1. **Costs of Undergrounding:**

O&R made a surcharge arrangement with its New Square customers to amortize the costs of placing its service to the village underground. I attach O&R's letter explaining the arrangement.

I realize that there may well be no comparison the between costs of New Square's underground installation and that required for an underground version of the North Lttle Tor Road substation, yet the costs in New Square are interesting.

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-Martus

RECEIVED
JUN 26 2012
TOWN PLANNING DEPT.

--
Martus Granirer, Lawyer
100 South Mountain Road
New City NY 10956
845 634-9700

O&R_Surcharge_for_New_Square_underground_lines-W-O_Banner.pdf
25K

James Creighton <j.creighton@clarkstown.org> Mon, Jun 25, 2012 at 7:13 PM
To: Jose Simoes <j.simoes@clarkstown.org>

TOWN OF CLARKSTOWN

OFFICE OF THE SUPERVISOR

ALEXANDER J. GROMACK
Supervisor

September 25, 2012

Shohreh Karimipour, P.E.
Regional Water Engineer
NYSDEC – Region 3 DOW
100 Hillside Avenue
Suite 1W
White Plains, New York 10603

Dear Ms. Karimipour:

I am writing to express the Town's serious concern, on behalf of the residents of Lake Lucille, regarding the work being performed by a builder of a subdivision in the Town of Ramapo, west of Buena Vista Road, near McCloud Terrace. As reported by the Journal News last week and today (see the attached articles). The developer has utterly failed to implement adequate erosion control measures, which is directly resulting in damage to Crum Creek, Lake Lucille and the Lake Lucille Dam. Moreover, as Lake Lucille feeds into Lake DeForest, the developer's action is jeopardizing our water supply.

We understand that the NYSDEC has issued a stop work order, however, I have received calls from residents who tell me that the developer is continuing to work at the site. Indeed, one resident documented sediment spanning approximately three miles, from the site to the Hackensack River entrance to Lake Deforest. We therefore request that the NYSDEC continue to closely monitor the construction and erosion control measures at the site so that Lake Lucille does not sustain further damage.

Lake Lucille is a private community; the residents finance the maintenance of the lake and the dam through their homeowners' association fees and through an "Aquatic District" that was sanctioned by the NYSDEC many years ago. We are requesting the NYSDEC's help, in the form of additional enforcement, to ensure that the residents of

10 Maple Avenue, New City, New York 10956 · Telephone 845.639.2050 · Fax 845.634.5456 · a.gromack@clarkstown.org

Lake Lucille are not saddled with the cost of reversing the damage caused by this developer.

Thank you for your attention to this matter. I would appreciate it if you would keep me apprised of the NYSDEC's progress.

Sincerely,

ALEXANDER J. GROMACK
Town Supervisor

AJG/co

Cc: Willie Janeway, Regional Director, NYSDEC
Hon. Christopher St. Lawrence
Ted Dzurinko, Director, Ramapo DPW
Luke Kalarickal, P.E., L.S., Director
Dennis Letson, First Deputy Director
William Terribile, President, Lake Lucille Association
Hon. Shirley Lasker
Hon. Frank Borelli
Hon. George Hoehmann
Hon. Stephanie Hausner

Town of Clarkstown

Diane Papenmeyer <d.papenmeyer@clarkstown.org>

Fw: Lake Lucille Utility Poles

1 message

j.simoes@clarkstown.org <j.simoes@clarkstown.org> Fri, Jun 22, 2012 at 5:15 PM
Reply-To: j.simoes@clarkstown.org
To: Diane Papenmeyer <d.papenmeyer@clarkstown.org>

Print and file..... You know the routine
Sent from my Verizon Wireless BlackBerry

From: William Terribile <wterribile@yahoo.com>
Date: Fri, 22 Jun 2012 14:07:49 -0700 (PDT)
To: m.connar@clarkstown.org<m.connar@clarkstown.org>;
t.trevor@clarkstown.org<t.trevor@clarkstown.org>;
p.streitman@clarkstown.org<p.streitman@clarkstown.org>;
g.heim@clarkstown.org<g.heim@clarkstown.org>; j.simoes@clarkstown.org<j.simoes@clarkstown.org>;
s.thormann@clarkstown.org<s.thormann@clarkstown.org>;
r.yacyshyn@clarkstown.org<r.yacyshyn@clarkstown.org>;
m.blumenthal@clarkstown.org<m.blumenthal@clarkstown.org>
ReplyTo: William Terribile <wterribile@yahoo.com>
Subject: Lake Lucille Utility Poles

Dear Board Members,
Just to update everyone, I got a call from Kim Campbell who works for O&R the morning after the last planning board meeting. She asked me if it would be alright if O&R goes out and assess the problem poles on Thursday or Friday and than meet with me on Monday June 18th to discuss how they would fix the pole.
Needless to say after emails and promises I am still waiting to hear from them. I email Kim and she says she will get back to me but never does that happen.If they can't stick to what they say to the planing board, why are we going to aloud a substation near a stream that people drink the water.

Bill Terribile
President of Lake Lucille

~!~

Draft responses to issues raised at the Clarkstown Planning Board public hearing on May 2, 2012 for the Little Tor Road substation project.

Mr. Granier (pg 44, line 13 to pg 45, line 8)

"Radiation" studies.

This term would be an incorrect characterization. Electric power engineers, researchers, and standards organizations would not refer to 60 Hz magnetic fields as "radiation".

Mr. Adip (pg 58, line 16 to pg 60, l1)

"The magnetic field is a subject which is unknown to engineers, to experts in this field."

Engineers and physicists have known and understood magnetic fields for well over 100 years. The basic equations describing electromagnetic field theory were developed by James Clerk Maxwell in the mid-1800s and are still used today.

The New York State EMF standard: "…basically it was just picked out of the blue."

The New York State Public Service Commission adopted what it considered to be a "prudent approach" as an EMF policy after extensive study and deliberations. The level of 200 mG is based on studies of "calculated fields under various operating conditions (because magnetic field varies with load) for all of the 345 kV transmission circuits in New York State." The policy and standards were given comprehensive reviews by others, including the Department of Environmental Conservation prior to adoption by the commissioners.

Ms. Walker (pg 62, line 19 to pg 65, 2)

"…electrified fence that's around the substation."

Orange & Rockland Utilities does not place electrified fences around its substations, and to our knowledge, neither does any other electric utility in the United States.

EMF study of African-American women

The National Cancer Institute web site also states: "Animal studies have not found that magnetic field exposure is associated with increased risk of cancer. The absence of animal data supporting carcinogenicity makes it biologically less likely that magnetic field exposures in humans, at home or at work, are linked to increased cancer risk."

The specific study mentioned by Ms. Walker is on breast cancer and electric blanket use by Kangmin Zhu and others; it is dated 2003. It suffers from very low participation rates among cases, no exposure assessment other than a telephone questionnaire, and potential control selection bias. More importantly is was done almost 20 years after the electric blanket industry started making blankets with a new design that has significantly lower EMF levels- a point mentioned by the study authors. This particular study and many other breast cancer studies were all evaluated by the World Health Organization (WHO) in 2007. The WHO concluded for breast cancer that "the evidence is sufficient to give confidence that magnetic fields do not cause the disease".

Ms. O'Connor (pg 68, line 21 to pg 69, 17)

Concern about World health Organization document

The WHO produced a comprehensive review of EMF research that was published in 2007. The report is 500 pages long and covers the topic in detail. It is possible to extract one sentence here-and-there, but in general the report is reassuring that after years of research no immediate health issues have been proven. Some other quotes from the WHO document include:

"Overall, these data do not indicate that ELF electric and/or magnetic fields affect the neuroendocrine system in a way that would have an adverse impact on human health and the evidence is thus considered inadequate."

"Overall therefore, the evidence for effects of ELF electric or magnetic fields on the immune and hematological system is considered inadequate. "

"Overall, the evidence for developmental and reproductive effects is inadequate."

"Overall, the evidence does not support an association between ELF exposure and cardiovascular disease."

The more important point here is that the proposed substation that is the subject before the Town of Clarkston Planning Board. Detailed EMF analysis demonstrates that the Little Tor Road substation itself does not have any practical effect on the residents' exposure at their homes or elsewhere. The EMF study demonstrates that the magnetic fields along roads adjacent to the proposed substation are due to the overhead power lines that already exist. Electric power substations do not generally create magnetic fields much farther than their perimeter fences. The dominate magnetic field source is always the power lines near or entering the substation. The Little Tor Road substation is also situated in a large area that has no residences next to it and since magnetic fields attenuate quickly with distance, it is not a significant source for the area.

3/7/12 Called [illegible] and asked [illegible] to look at his comments and not just a general response. No agreement. [illegible]

MORTON LEIFER PE.

ELECTRONIC COMMUNICATIONS SPECIALIST

TOWN OF CLARKSTOWN

XST, XJS, XJC, XDEC, XGI, XDTA, XMcNulty (fax) file

RECEIVED
OCT 17 2011
TOWN PLANNING DEPT.

To: Honorable Shirley J. Thormann Chairperson
Honorable Members of the Clarkstown Planning Board
From: Morton Leifer
Date: October 17, 2011
Re: Magnetic Field Modeling Assessment for the Little Tor Substation.

Dear Ms. Thormann,

I have carefully reviewed the Draft Environmental Impact Statement submitted on behalf of Orange & Rockland Utilities Inc. that was prepared by Enertech Consultants of Santa Clara Inc. of Campbell, California.

The report posits that "The New York Public Service Commission standard requires magnetic field levels at the edge of a transmission line right-of-way to be under 200 mG at maximum load. Calculated magnetic field levels for all of the transmission line and distribution line circuits associated with this project are below this 200 mG standard".

Computer modeling of the magnetic fields around the perimeter of the proposed substation convincingly demonstrate that the magnetic fields due to the proposed construction of the substation's electrical equipment will produce significantly less than 200mG at the perimeter of the proposed substation.

The electrical transformers and associated switchgear will not be located near the perimeter of the substation. The distance of the electrical equipment to the perimeter of the substation will reasonably attenuate the magnetic fields to the calculated levels of 2 to 3 mG. The additional distance from the substation perimeter to the property lines will further reduce the magnetic fields to the calculated values of 0.2 – 0.3 mG.

In summary, there would likely be no increase of magnetic field levels at the perimeter of the property due to the installation of the proposed transformers and switchgear within the substation.

I must point out, however, that on my visit to the property I measured the levels of magnetic field along the property line to be anywhere from 3 to 75 mG, the higher value due to the existing 138 KV transmission lines. These levels would persist along the right-of-way of the transmission lines far distant from the proposed substation. I also measured magnetic field values in the 75 mG range all along the 13.2 KV distribution lines that are ubiquitous on N. Little Tor Road and South Mountain Road. The magnetic field from these 13.2 KV distribution lines is strong because they are much closer to ground level than the 138KV transmission lines.

20 Maple Avenue New City New York 10956 845-406-0729 m_leifer@town.clarkstown.ny.us

While I believe there is no issue with the 34.5kV sub-transmission line to Tilcon, because there is a well-defined and existing right-of-way that can be easily seen and avoided by pedestrians, I am troubled by the four proposed 13.2KV underground distribution lines.

The report forecasts significant current loads for these underground distribution lines. They are not buried deeply and are therefore much closer to the ground level than the elevated 13.2 KV distribution lines mounted on the telephone poles. The magnetic field from the underground 13.2 KV lines can be significant, and coupled with the overhead lines can represent an environmental issue for the area that must be more carefully considered.

The report provides no specificity as to where these underground lines will be located, their paths and extent into the surrounding area.

I understand that the primary purpose of building the substation is to provide additional electrical capacity to the area. The proposed four 13.2 KV underground distribution lines are necessary to accomplish that.

With regard to magnetic fields, the focus of the report has been almost entirely on the electrical equipment proposed to be built within the substation. The report reasonably concludes that there would be negligible magnetic flux density outside of the property lines due to the electrical transformers and associated switchgear.

The primary environmental effect on the community with regards to increased magnetic field exposure is, in fact, the proposed four underground 13.2 KV distribution lines and their associated electrical equipment. The report should include details of where the lines would be located, what magnetic field mitigation would be implemented and what signage would be used to keep people from unknowingly congregating in areas of high magnetic flux density.

Underground 13.2 KV distribution lines are used in many neighborhoods in Clarkstown. They are, however, rarely used where there is such a high density of overhead electrical distribution lines already in existence.

I believe a more in-depth study of the proposed underground distribution lines and their associated equipment, such as electrical transformers should be undertaken and specific details provided as part of the Environmental Impact Statement.

Respectfully submitted,

Morton Leifer

Morton Leifer PE.

XPBX 51, XYS.XYC, XDEC,
XBI, X 7AMPLE, X Montalbano

MORTON LEIFER PE.

ELECTRONIC COMMUNICATIONS SPECIALIST

TOWN OF CLARKSTOWN

File

To: Honorable Shirley J. Thormann Chairperson
Robert Geneslaw, Planning Consultant

From: Morton Leifer

Date: April 29, 2012

Re: O & R Substation, Little Tor Road & South Mountain Road, New City, Comments for DEIS Public Hearing, May 2, 2012.

I have carefully considered the technical issues associated with the proposed Little Tor Substation project with regard to the cellular antennas and the electrical equipment, transformers and underground 13.2KV transmission lines.

I can conclude that the proposed Little Tor Substation project will have no significant or measurable effect on the existing ambient magnetic fields in the area.

I have no additional Technical/Substantive comments on the DEIS.

Respectfully,
Morton Leifer

Morton leifer PE.
Electronic Communications Specialist

Clarkstown Police Department
20 Maple Avenue, New City, NY 10956
P: 845.406.0729
E: m.leifer@Clarkstown.org

MORTON LEIFER PE.

ELECTRONIC COMMUNICATIONS SPECIALIST

TOWN OF CLARKSTOWN

X ST, x JS, x JG, x DEC, x GI, X DTA, x Mark Hellman (fax) (1)

To: Honorable Shirley J. Thormann Chairperson
Honorable Members of the Clarkstown Planning Board
From: Morton Leifer
Date: October 17, 2011
Re: Magnetic Field Modeling Assessment for the Little Tor Substation.

RECEIVED
OCT 17 2011
TOWN PLANNING DEPT.

Dear Ms. Thormann,

I have carefully reviewed the Draft Environmental Impact Statement submitted on behalf of Orange & Rockland Utilities Inc. that was prepared by Enertech Consultants of Santa Clara Inc. of Campbell, California.

The report posits that "The New York Public Service Commission standard requires magnetic field levels at the edge of a transmission line right-of-way to be under 200 mG at maximum load. Calculated magnetic field levels for all of the transmission line and distribution line circuits associated with this project are below this 200 mG standard".

Computer modeling of the magnetic fields around the perimeter of the proposed substation convincingly demonstrate that the magnetic fields due to the proposed construction of the substation's electrical equipment will produce significantly less than 200mG at the perimeter of the proposed substation.

The electrical transformers and associated switchgear will not be located near the perimeter of the substation. The distance of the electrical equipment to the perimeter of the substation will reasonably attenuate the magnetic fields to the calculated levels of 2 to 3 mG. The additional distance from the substation perimeter to the property lines will further reduce the magnetic fields to the calculated values of 0.2 – 0.3 mG.

In summary, there would likely be no increase of magnetic field levels at the perimeter of the property due to the installation of the proposed transformers and switchgear within the substation.

I must point out, however, that on my visit to the property I measured the levels of magnetic field along the property line to be anywhere from 3 to 75 mG, the higher value due to the existing 138 KV transmission lines. These levels would persist along the right-of-way of the transmission lines far distant from the proposed substation. I also measured magnetic field values in the 75 mG range all along the 13.2 KV distribution lines that are ubiquitous on N. Little Tor Road and South Mountain Road. The magnetic field from these 13.2 KV distribution lines is strong because they are much closer to ground level than the 138KV transmission lines.

20 Maple Avenue New City New York 10956 845-406-0729 m_leifer@town.clarkstown.ny.us

While I believe there is no issue with the 34.5kV sub-transmission line to Tilcon, because there is a well-defined and existing right-of-way that can be easily seen and avoided by pedestrians, I am troubled by the four proposed 13.2KV underground distribution lines.

The report forecasts significant current loads for these underground distribution lines. They are not buried deeply and are therefore much closer to the ground level than the elevated 13.2 KV distribution lines mounted on the telephone poles. The magnetic field from the underground 13.2 KV lines can be significant, and coupled with the overhead lines can represent an environmental issue for the area that must be more carefully considered.

The report provides no specificity as to where these underground lines will be located, their paths and extent into the surrounding area.

I understand that the primary purpose of building the substation is to provide additional electrical capacity to the area. The proposed four 13.2 KV underground distribution lines are necessary to accomplish that.

With regard to magnetic fields, the focus of the report has been almost entirely on the electrical equipment proposed to be built within the substation. The report reasonably concludes that there would be negligible magnetic flux density outside of the property lines due to the electrical transformers and associated switchgear.

The primary environmental effect on the community with regards to increased magnetic field exposure is, in fact, the proposed four underground 13.2 KV distribution lines and their associated electrical equipment. The report should include details of where the lines would be located, what magnetic field mitigation would be implemented and what signage would be used to keep people from unknowingly congregating in areas of high magnetic flux density.

Underground 13.2 KV distribution lines are used in many neighborhoods in Clarkstown. They are, however, rarely used where there is such a high density of overhead electrical distribution lines already in existence.

I believe a more in-depth study of the proposed underground distribution lines and their associated equipment, such as electrical transformers should be undertaken and specific details provided as part of the Environmental Impact Statement.

Respectfully submitted,

Morton Leifer

Morton Leifer PE.

* * * COMMUNICATION RESULT REPORT (FEB. 9. 2012 2:26PM) * * *

FAX HEADER 1: PLANNING DEPARTMENT
FAX HEADER 2:

TRANSMITTED/STORED : FEB. 9. 2012 2:25PM

FILE	MODE	OPTION	ADDRESS	RESULT	PAGE
2245	MEMORY TX		18452150054	OK	1/1

REASON FOR ERROR
E-1) HANG UP OR LINE FAIL
E-2) BUSY
E-3) NO ANSWER
E-4) NO FACSIMILE CONNECTION

MORTON LEIFER PE.

ELECTRONIC COMMUNICATIONS SPECIALIST

TOWN OF CLARKSTOWN

XPB, XST, XJS, XJC, XDEC, XEI, XMMelk, XMarshall, XLBrescia

To: Honorable Shirley J. Thormann Chairperson
Honorable Members of the Clarkstown Planning Board
From: Morton Leifer
Date: February 8, 2012
Re: Enertech's response dated November 16th to my report on Magnetic Fields at the ~~[illegible]~~ proposed Little Tor Substation dated October 17, 2011.

Dear Ms. Thormann,

I have carefully reviewed Enertech's response to the issues I raised concerning the location, paths, and the extent into the surrounding area of four (4) underground 13.2 KV transmission lines associated with the proposed Little Tor Electrical Substation.

Their detailed narrative coupled with an enlarged diagram that more clearly shows the location, paths and extent of the underground transmission lines, has made it possible for me to make an appropriate assessment of the magnetic fields associated with these lines.

The four proposed underground 13.2 KV transmission lines will be used to connect the proposed substation to the existing overhead distribution line system already serving the electrical needs of the Little Tor and South Mountain Road area. They will replace a power source from a more distant Electrical Substation that currently energizes the existing overhead distribution lines in the Little Tor and South Mountain Road area.

The four proposed underground 13.2 KV transmission lines connect to the existing overhead distribution system via riser poles within or at the property line of the proposed Substation.

The Entertech response clearly indicates that none of the proposed underground 13.2 KV transmission lines will extend beyond the property lines of the proposed Substation.

Based on the Entertech response, coupled with magnetic field measurements I have made in the area, I can conclude that the proposed Little Tor Substation project, including the proposed underground 13.2 KV transmission lines, will have no significant or measurable effect on the existing ambient magnetic fields in the area.

I recommend that the magnetic fields associated with the proposed Little Tor Substation should not be an issue of concern in the determination of the suitability of the project in the area.

Respectfully Submitted,
Morton Leifer
Morton Leifer

RECEIVED
FEB - 9 2012
TOWN PLANNING DEPT.

20 Maple Avenue New City New York 10956 845-406-0729 m.leifer@clarkstown.org

x DEC x BI xDTA
x ST xJ Sx montalbano
x RA
file

ALFRED J. LONGHITANO, P.E. LLC
Professional Engineer
26 Salem Road, Chappaqua, NY 10514
Tel. (914) 238-7125
Fax (914) 238-7129
e-mail: alonghitano@cc.com

RECEIVED
AUG - 6 2012
TOWN PLANNING DEPT.

July 23, 2012

Commissioner Thomas McGrath
New City Fire District

Re: Little Tor Substation
Orange & Rockland Utilities
Clarkstown, NY

Dear Commissioner McGrath:

The following comments are the result of my review of 9 sheets of plans for the Little Tor Substation that is being proposed by Orange & Rockland Utilities, Inc. for construction at a site located at the intersection of Little Tor Road and South Mountain Road in the Town of Clarkstown. I realize that these comments ask more questions than they answer, but that is because the issues should be important to the Fire Department, and they do not appear to be answered in the plans.

Sheet 2 of 9, EXISTING CONDITIONS AND DEMOLITION PLAN

I see no existing water mains in the surrounding streets. Are there municipal water mains that can feed master stream devices or do we need to request a captive water supply such as a cistern or water storage tank for firefighting?

The plan shows several different elevations between 134 and 140 for the 100-year flood line. I am using EL 140 for purposes of this review.

The only access to the site is from Little Tor Road, south of South Mountain Road. South of South Mountain Road, all of Little Tor Road and about the first 180 feet of the site access road are within the 100-year flood line (EL. 140). In case of a major fire

during flooding, the Fire Department vehicles may not have access to the substation. Is there any way that an access road can be brought in via South Mountain Road where the site terrain is all above the 100-year flood elevation.

The proposed access road cuts directly through an existing dwelling as well as two wooden sheds that are ***NOT*** labeled as being removed. Is this an oversight on the plan or are the structures really being left in place? These structures do not appear on Sheet 4 of 9. Which plan is correct?

Dwellings A, C, D, H, one unlabeled dwelling and the Verizon building are all within a reasonably predictable explosion damage range. Are they being removed? Except for the Verizon building, they do not appear on Sheet 4 of 9. Which plan is correct?

Sheet 4 of 9, LAYOUT AND UTILITY PLAN

This sheet shows none of the existing buildings and sheds except the Verizon building. Is it intended that all other existing structures are being razed?

The access road from Little Tor Road is only 18 feet wide. If you set up an aerial apparatus to apply overhead master streams, no vehicles will be able to pass that ladder. If you bring in an engine first laying 5" hose up the access driveway, that charged hose line will restrict access to any other vehicles. You really need a wider access road (27' – 30').

The asphalt access road that surrounds the transformers and switchgear is only 16 feet wide. You need wider access than that (27' – 30').

How many transformers and phase angle regulators are going on this site? How many gallons of oil does each unit hold? Are there any blast walls between units to limit an incident to a single unit and to protect the Verizon building from concussion and shrapnel? Is the gravel area provided with a trapped drainage system to drain off the spilled oil to a sump? Are the transformers protected by deluge water spray systems?

All access for fire apparatus is to the north and northeast of the transformers. Prevailing winds from the southwest will generally have you taking a downwind position to fight a very smoky oil fire. You need to be able to attack a fire from the south and west sides of the transformers. High tension lines to the immediate west must also be considered.

As indicated on Sheet 2, I see no source of water for firefighting on the plans. No public hydrants or water mains are shown on the plans. Hydrants at the four corners of the asphalt loop around the transformers, each fitted with a turret monitor with adjustable nozzle would allow the application of master stream flows with minimal exposure to manpower and apparatus. However, assuming four 500 GPM nozzles operating, the water supply requirement would be at least 2000 GPM at sufficient pressure to maintain 100 PSI at the nozzles. Is there a street main that can supply 2000 GPM? If so, you would want two 5" fire department connections that would allow two engines to boost the

pressure into the loop that feeds the hydrants. You would want those FDCs to be located where they will be a safe distance from the transformers and preferably not downwind of them. Of course it would be advantageous to have a high-volume public hydrant from which pumpers can draw suction located at the head of the access driveway, and a private hydrant about halfway up the driveway. In addition, at least one public hydrant should be available where it will not be affected by the 100-year flood.

Sheet 5 of 9. GRADING PLAN

There is a very steep slope from the transformer pad to the sumps. Is there a curb around the gravel area to limit the surface flow of burning oil? Frequently, transformers are in a kind of concrete "tub" filled with gravel and the "tub" is sized to hold the oil spill plus the water and foam that the fire department applies. If that is the case, firefighting should be mainly within the gravel area. If not, the fire could cover the sump area as well as the gravel area. That could necessitate additional hydrants northeast and southeast of the sump area.

The access driveway rises 13 feet (137 to 148) over a distance of 100 feet as apparatus approaches the northeast corner of the transformer pad. This is probably as close as you would want to set up an aerial master stream device. Can the ladder equipment that you have be stabilized on a 10% – 12% grade?

Respectfully,

Alfred J. Longhitano, P.E., FSFPE
Fire Protection Engineer

June 13, 2012

Dear Ms. Thormann:

I am unable to attend tonight's meeting on the proposed substation in New City. Due to time limitations at the meeting last week, I did not have a chance to finish my presentation and raise a number of additional critical questions that need to be answered in the DEIS.

Therefore, I ask that you read the following into the record for the benefit of the public:

1. The proposed substation site already has a cellular communications tower from Verizon. The potential health effects of cell towers remains controversial and long-term exposure impacts are unknown, but the Town of Clarkstown has implemented regulations that take a "prudent avoidance" approach to placement of these facilities in residential neighborhoods, near schools and other areas where young children would spend significant time. Given the existing EMFs generated by the existing high voltage transmission lines and the provided data suggesting potential health impacts of EMFs on children (i.e. the Oxford University study), the DEIS should provide data about the "cumulative risks" of a cell tower, transmission lines and the proposed substation.

2. Given the health risk information that I've provided on EMF exposure, the Town of Clarkstown should retain consultants with technical and medical expertise to better understand the risks associated with the combination of the existing transmission lines and cell tower with the proposed new substation. I can provide the Town with a list of potential expert consultants; however I've been told that David Carpenter of the University at Albany is a top expert in this field and would potentially be a very appropriate choice (http://www.albany.edu/news/experts/8212.php). I would also recommend Dr. Gerald Draper of the Oxford Study, although he is now retired, so I don't know if he is still doing consulting work. Dr. Carl Baum (no relation) of the Yale School of Medicine is available, too.

3. The DEIS has a very limited exploration of the potential impact of electrical substations on the value of neighboring residential properties. It does not explore the combined impact of an electrical substation and related overhead transmission lines plus a gas substation and related gas lines plus a cell tower and related facilities. The DEIS should provide information on similar electrical substations in

residential neighborhoods around the U.S. that are co-located with gas substations and cellular towers since these facilities collectively create more risks. Projected property value impacts should only be determined using these locations only, not by using stand-alone electrical substation facilities.

4. The DEIS should provide data about the current EMF levels along the transmission lines between the two neighboring Haverstraw substations and the Pascack Road substation in Spring Valley. With the addition of the substation at South Mountain Road and the increased usage (for instance with the switch of Tilcon's dedicated transformer from Haverstraw to New City), will the EMF levels along the transmission lines increase (usage levels of transmission lines do impact EMF levels and a lower-powered transmission line can actually have more EMF than a high-powered transmission line)?

5. Why does O&R plan to move Tilcon's dedicated transformer from Haverstraw to New City? Please describe in detail and give all information on how the 20MVA transformer will be connected between the substation and the facility. The DEIS should have peak load data (at startup) for Tilcon, not just standard load data.

6. United Water is planning a controversial desalination plant in Haverstraw. The desalination, filtration and pumping process will require a massive amount of electricity. Which substation or substations will be providing that power? Will United Water need dedicated transformers or a new substation and, if so, where will those facilities be placed? Does the move of the Tilcon transformer have anything to do with the O&R being able to meet the needs of United Water?

7. Currently, the Haverstraw substation provides electricity to northern New City, yet there is no indication in the DEIS that the New City substation will be providing service coverage or backup to Haverstraw. Why not? Won't this become more important if the desalination plant comes online?

8. If the United Water project is approved, is it possible that the New City substation will need to be expanded? Will the Applicant guarantee that this substation will never be expanded beyond the current proposed substation, as it has already done elsewhere?

9. The former President of O&R, John McMahon, stated at an annual meeting in 2008 his company's "plan" to build 21 substations and modify/upgrade others. Are there any plans to add, upgrade or modify any substations that directly or indirectly connect to the proposed New City substation including the Haverstraw

substations, New Hempstead substation, the Pascack Road substation, the Congers substation and the Route 59 West Nyack substation?

10. The Applicant gives very limited alternatives in the DEIS. The DEIS should include:
    a. Plans for placing the substation and related transmission lines underground.
    b. Plans for alternate locations like the Tilcon quarry in Haverstraw and at the Burts Road industrial park in northern New City.
    c. Plans for meeting New City's future electrical needs using clean, locally-generated solar electricity.

11. New Jersey has installed more solar panels in the first two months of 2012 than New York State has done in its entire history. In PSE&G's service territory, solar panels will be generating 80 megawatts of power. 40 megawatts will come from solar panels placed on existing utility poles and 40 megawatts will come from centralized locations (http://www.pseg.com/family/pseandg/solar4all/index.jsp). Clarkstown is already considering using the former landfill in West Nyack for the installation of a solar farm, and the State of New York is considering the bi-partisan "Solar Jobs Act" to significantly increase the generation of solar power for our grid. The Applicant's existing DEIS proposes to perpetuate the current antiquated system. It should explore forward-thinking alternatives, as well as ways to reduce current energy usage/growth in northern New City, such as switching to LED street lights.

12. The DEIS should provide actual usage data for northern New City and projections for future use. Residential and commercial growth in the area has slowed, especially after the economic downturn of 2008, and the Town is now virtually built-out. Government employees are being reduced. Everyone is going "green" with lower wattage light bulbs, appliances, heating & air conditioning systems, etc. Today's big LED TVs and computers use significantly less electricity than older devices. The usage data is needed to evaluate the needs of northern New City and to understand if other factors, like the proposed water treatment plant in Haverstraw, are the underlying need for the proposed substation. If so, this might raise additional questions about segmentation.

13. How can O&R ensure that employee or contractor errors, like what happened with the massive gas explosion earlier this year in Haverstraw, won't happen at this facility?

I will be separately be submitting a variety of supporting documentation in an email to the Planning Board.

Thank you very much.

Sincerely,

Marvin Baum
Valley Cottage, NY.

Jose Simoes

From: Musso, Michael P. [Michael.Musso@hdrinc.com]
Sent: Wednesday, May 27, 2009 8:12 AM
To: Jose Simoes; m_leifer@town.clarkstown.ny.us
Cc: Charlie Maneri; 'Dennis Letson'; d_kraushaar@town.clarkstown.ny.us; Amy Mele; Edward M. Ross
Subject: FW: O&R Sub-station Project / Verizon
Attachments: New City - South Mt Rd - FCC Compliance Report.pdf

Attached is the RF report for the proposed Verizon antenna re-location at the O&R substation project.

The rpt only discusses the wireless antennas (and not the elements of the substation).

O&R has asked for a memo from AAB, documenting that they interacted with the Board and provided all requested information.

I will draft up a memo and distribute for your review. I will be sure to indicate that our review focused only on the Verizon aspects and NOT on the larger substation project.

Morty – take a look and let me know if comments on the RF.

Michael P. Musso, P.E.
Senior Project Manager
HDR ONE COMPANY | ***Many Solutions***
One Blue Hill Plaza | Pearl River, NY | 10965
Phone: 845.735.8300 ext. 260 | Fax: 845.735.7466 | Mobile: 845.304.9639
Email: Michael.Musso@hdrinc.com
www.hdrinc.com

From: Trimarchi, Joseph [mailto:trimarchij@oru.com]
Sent: Tuesday, May 26, 2009 1:59 PM
To: Musso, Michael P.
Cc: Heady, James; Lanza, Joanne
Subject: RE: O&R Sub-station Project / Verizon

Mike,

As requested, please find the attached RF report for the proposed omni antenna replacement.

I believe that this is the last outstanding item. If the Antenna Advisory Board is satisfied with the report and no further information is required could a letter stating this be sent to us so that we can include it in our E.I.S. submittal?

Please let me know if you have any questions.

Thank you,

Joe Trimarchi

From: Trimarchi, Joseph
Sent: Tuesday, April 14, 2009 2:52 PM

To: 'Musso, Michael P.'
Cc: Heady, James
Subject: O&R Sub-station Project / Verizon

Mike,

For your records I am sending (4) four copies of the following drawings that were provided to you electronically prior to our meeting on 3/25:

- Little Tor Substation "Site Plan" drawing number N-F-8762, sheet 2 of 8, Rev. E, dated 4/1/09.
- Little Tor Substation "Electric Elevations" drawing number N-F-8762, sheet 5 of 8, Rev. C, dated 4/1/09.

They will be coming regular mail to the address you have below.

Thanks,

Joe

From: Musso, Michael P. [mailto:Michael.Musso@hdrinc.com]
Sent: Monday, March 23, 2009 5:45 PM
To: Trimarchi, Joseph
Subject: RE: O&R Sub-station Project / Verizon...email 1 of 3

Joe – I think these will suffice for the AAB mtg. If more needed later on, I'll let you know.

Thanks, and see you Wednesday. We'll ask that you provide a verbal description on the proposed action, as related to Verizon only. The Board may also have some questions for you...

Mike

Michael P. Musso, P.E.
Senior Project Engineer
HDR ONE COMPANY | ***Many Solutions***
One Blue Hill Plaza | Pearl River, NY | 10965
Phone: 845.735.8300 ext. 261 | Fax: 845.735.7466 | Email: michael.musso@hdrinc.com
www.hdrinc.com

5/2/12 O+R Substation

1. Teri Thale - W. Branch Conserv Assoc
streams - Hackensack / Lake Lucille
Oil stored in transformers - spilled
oil will coagulate and clog up
the system and ~~prevent the~~ sender
it ineffective

2. Jan Conor - Real Estate broker ?s
little or no diminution of
property values. Property values
affected by transmission lines
Beckman report had comparison w
4 properties ~~but~~ no next to substations
2 next to RR which has affected
price and too few # to be representative
Expectations / Fear will
affect value

3. Marvin Baum - Photosims ~~not~~
do not represent the landscaping
accurately - ROW will be
cleared / must be by PSC ~~or~~
order - ~~PSC~~ Photosims is
not showing clearing +
tall grow trees under ROW
which ~~and~~ NOT shown on
are landscaping plans

~~#30~~ Photosims are showing mature growth of landscaping 30/40 years. should be 5-10 years - NOT enough information regarding Dangers of an "event" at a substation - equipment failure etc. in Florida 2009 Dunwoodie substation, Yonkers
DEIS should deal with the worst-case scenario - type of materials - such as mineral oil → may let it burn ~~&~~
~~2010~~ Pleasantville + NYC
Trees could increase potential for brush-fire -
~~Ex~~ alternatives →
① underground or ② enclosed

~~Dam~~ Firefighting - oil / water could get to Hackensack
85% Residential but
15% Tilcon
1 transformer is for Tilcon alone
Is this just for Tilcon?

4. Henry Vogel - Very rural -
concerned to fire - water
supply in area for firefighting
~~How will~~ Water supply line
may be needed
5. Martus Granier -
concerned to radiation coming
off site - water comment
10 day ~~[illegible]~~ submission
Hovea firm to model the
radiation from ~~[illegible]~~ site
O+R has begun to enlarge 32
other substations through ~~the~~ RC
~~[illegible]~~ - SEQRA reqs that
an entire action be
considered NOT a segment / This is
a segmentation of - part of a
larger plan
appearance of ~~[illegible]~~ site is
inaccurate - trees in ROW -
that are mature when PSC
reqs ~~no~~ trees
- Substance under gravel which
will solidify when ~~the~~ oil
touches it - ~~[illegible]~~ once -
that happens its ineffective for the next time
Solar flares cause substations
to ~~[illegible]~~ blade

6. William Terribeal - 290 S. Mtn Rd
President Lake Lucille HOA
4/10 th mile is nearest fire hydrant to site
allied Biological is testing Lake Lucille - Transmission line that goes through lake to feed Tilcon
Wants to know if anyone else is using line - should only be to Tilcon
2008 - Pole is broken in Lake and they have never done anything
Xdrivs of substation from Lake will be affected
7. Susan Staba - 251 S. Mtn Rd.
↳ photographer - substation had impact - dirt had blown across road - site has been cleared out from edge to edge - site is eroding - Fire Hazard
Water table affect - Stormwater
Underground springs -
impact of noise - wants to look into substation in Congers

8. Fuad Ahmed P.E. 157 S. Mtn Rd -
Geocomposite materials - specifics
How much oil in each transformer
Phase I - 500 pages - looking for
section of foundation of
transformer.
Noise - ~~alt~~ - barriers in N + W
Residential value - hard to
believe
Magnetic Fields - subject is
unknown - State accepted
200 mG because ~~it is existing~~ is
had no other? hmm
Geocomposite - Sorp Web plus
Gel-type material -
However transformers may
develop ~~cro~~ chronic leaks -
material will be used up?
Who is monitoring this?
How will be cleaned / removed?
9. Kirsten Walker - 211 S. Mtn Rd -
Ernie ~~Kolbak~~ House ~~[illegible]~~ Electrified Fence
Log ~~Street is historical~~ Fire Hazard
abin National Cancer Institute -
are increased risks
Child has autism - (may be caused by
Power lines)

McJ

10. O'Connor

~~10.~~ W.H.O. - ~~neurogenet~~ EMF - in-depth studies on problems from transmission

11. Mara - "redundant system"

12. Heim - trees further from substation → ? to Marvin

Causes of transformer fires

June 6 - 7:30 PM

Orange & Rockland
a rockland, inc. company

Orange and Rockland Utilities, Inc.
One Blue Hill Plaza
Pearl River NY 10965
www.oru.com

March 14, 2012

Mayor Mates Friesel
Village of New Square
766 North Main Street
New Square, NY 10977

Dear Mayor Friesel:

As you know, in 2007, O&R and the Village of New Square embarked on a unique partnership that resulted in the completion of a major project to relocate an electric transmission line that ran through the center of the Village.

This project was initiated and undertaken at the request of the Village, and as a result, a 3,300 foot section of electric line that formerly ran overhead has been placed underground, and the steel transmission towers that had supported it have been removed.

All parties agreed in planning the project that a portion of the project's costs would be recovered through a surcharge on village residents' electric bills that is spread out over 40 years. This surcharge initially appeared in April 2007 as a new line item on village residents' O&R bills that is labeled: *Municipal Surcharge*. This surcharge was initially set at 1.713 cents/kWh.

The surcharge for 2012 will begin appearing in New Square customers' April bill and will be $0.01776 per kWh.

If you have any questions about this annual reconciliation of the surcharge, please call me at (845) 577-2459.

Sincerely,

Trish Austin

Trish Austin
Public Affairs Manager

Cc: Izzy Spitzer – Deputy Mayor
David Breuer – Village Clerk

2012newsquaresurchargeupdateletter

TOWN OF CLARKSTOWN
DEPARTMENT OF PLANNING

JOSE C. SIMOES, Principal Planner
JAMES CREIGHTON, Planner
10 MAPLE AVENUE
NEW CITY, NEW YORK 10956-5099
(845) 639-2070
(845) 639-2071 (fax)
planning@clarkstown.org

TOWN OF CLARKSTOWN
PLANNING BOARD

SHIRLEY J. THORMANN, Chairwoman
RUDOLPH J. YACYSHYN, Vice Chairman
GILBERT J. HEIM, Member
PETER E. STREITMAN, Member
THOMAS A. TREVOR, Member
MARY JANE E. O'CONNOR, Member
MARA S. BLUMENTHAL, Member

June 4, 2012

✓✓ Owner and/or ✓ Attorney
Engineer
✓Town Attorney
✓Town Clerk
✓Building Dept.
✓Environmental Control
Traffic & Traffic Fire Safety
✓Supervisor

✓R.C. Dept. of Planning ✓R. Geneslaw
R.C. Dept. of Highways ✓James Coyle
Orange & Rockland Utilities ✓E. Potenta
Architecture & Landscape Commission
✓Highway Dept. ✓M. Leifer
N.Y.S.D.O.T.
Zoning Board of Appeals
✓Town Board

Attached are the minutes of the Planning Board Meeting of May 2, 2012.

Court stenographer present for this portion of meeting: Verbatim transcript (CDs) in file.

PUBLIC HEARING: DEIS: O&R UTILITIES, INC./LITTLE TOR ROAD SUBSTATION, SL 34.5-1-6 (FKA 25B1) NEW CITY (Proposed construction of a new electrical substation and upgrade an existing gas regulator on 10.2 acres R-40 zoned land, corner of North Little Tor Road and South Mountain Road, with a street address of 549-555 North Little Tor Road).

Chairwoman Thormann recognized Anthony Montalbano, attorney for applicant; John Coffey, Chief Engineer, Orange & Rockland; Joanne Lanza, Senior Engineer, Orange & Rockland, then read background information (see file).

Chairwoman Thormann advised the order of business this evening is as follows: Index cards will be handed out to those persons wishing to speak during the public hearing portion of the meeting; names and addresses to be provided; secretary to the Planning Board will distribute same and return (to Chair); further requested of the participants if a previous speaker has already addressed an issue, not to be repeated.

Chairwoman announced Planning Consultant Geneslaw will narrate the process for the DEIS: Planning Consultant Geneslaw advised the first public meeting was held in December of 2008; a lot of comments were made and all are reflected in the documents that have been provided. Continuing, Mr. Geneslaw advised O & R "went away" for a while, and upon "their return" a DEIS was prepared as well as a technical appendix for review; further advised the staff and consultants to the Planning Board reviewed the document to determine its completeness prior to a public hearing. After review, in February of 2012, the document was accepted for completeness by the Planning Board; further advised the purpose of tonight's meeting is to receive public comments and is not intended as a back and forth dialogue and/or debate, only intended for the Planning Board to collect information and questions and comments that can receive responses in the next phase.

continued

Planning Consultant Geneslaw further added whenever the public hearing is closed, the written record has to be kept open for a minimum of 10 days so comments can be added; next phase will be the preparation of a Final Environmental Impact Statement: Continuing, the first draft of the FEIS will be prepared by the project's sponsor's team; Town consultants will review to make sure it comes as close as possible to the Planning Board's point of view in each response; this is critical as the response to the comments must represent the Board's point of view; once the FEIS is accepted by the Planning Board, the next phase is a Findings Statement, which is a summary of the project, identification of any adverse impacts and the mitigation measures that will be taken to take care of them; that will conclude the environmental process.

Mr. Geneslaw further added there will be a series of meetings by various Town agencies to review various aspects of the proposal and the applicant will return to the Planning Board for site plan approval, which is the last stage in the process: This process will go on for approximately 4 to 6 months, or perhaps longer.

Mr. Coffey, Chief Engineer for O & R, gave a brief description of the proposed substation and the justification for it being constructed, as it is a reliability upgrade for service for the Town of Clarkstown.

Chairwoman Thormann announced call for Public Hearing: The following rose:

Terri Thal, resident of Lake Lucille: Spoke about the watercourses and her concern that any oil that triggers a stoppage of the absorption of oil will result in oil running into the streams, down into Lake Lucille and further into the Hackensack River; discussion ensued.

Jan Connor, retired real estate broker: Expressed concern the proposed sub-station will result in a reduction of property values and referred to the Beckman Report submitted by Coyle and Coyle; discussion ensued.

Marvin Baum: Expressed his concern in reviewing the DEIS the photo simulations were inconsistent with the landscaping plan that was presented; requested photo simulations that depict reality and show what it will look like 5 to 10 years out; lengthy discussion ensued.

Mr. Baum exhibited photos to Planning Board and consultants, as well as videos from his IPad depicting a substation explosion/ fire. Mr. Baum further added the transformers that have been put up in Westchester, New York City and many other places have generated explosions and fires; continuing, the place where O & R plans to put up this substation is in an area where forest fires occur and threaten life and property. Mr. Baum expressed his opinion O & R's overall attitude toward fire is cavalier and does not seriously offer preventive, protective or fire fighting measures; discussion ensued. Mr. Baum presented for the file various correspondence and articles on substations.

Henry Vogel: Advised he, too, is concerned with fire as the area is rural; brief discussion.

Martus Granirer: President of West Branch Conservation Association: Requested the Planning Board extend the comment period as (they) have been trying to look into fundamental questions, i.e. amount of radiation that will be caused by substation; further expressed although there is a detailed summary in the DSEIS, want to conduct their own study and need time to accomplish same: Mr. Granirer further requested a minimum of four weeks for a new study to be done by

continued

(their) consultant; discussion ensued. Mr. Granirer also expressed concern over the expansion of other substations in the area and expressed concern about the potential for segmentation as SEQR looks at the entire action; brief discussion ensued on the concerns relating to the factual matters in the impact statement.

William Terribile, 290 South Mountain Road, President of Lake Lucille Homeowners Association: Expressed concern over the potential for fire and the closest fire hydrant being 4/10 of a mile away; discussion ensued; also expressed concern over the drinking water and keeping it clean. Mr. Terribile also advised an electric pole snapped off at the top and is in the lake; this occurred in 2008 and was reported to O & R and to this date, has not been taken care of.

Susan Stava, 251 South Mountain Road: Stated for the record the meetings are very informative. Ms. Stava narrated a brief history of her experiences on South Mountain Road as a photo journalist over the years. Expressed her concerns over water issues, noise issues, eroding of the road and potential for a fire hazard; brief discussion ensued.

Fuad Adib, 151 South Mountain Road: Advised has a doctorate in civil engineering with a specific area of environmental engineering, as well as a professional engineering license in the State of New York. Stated in reviewing environmental impacts, the main criteria is to determine if it complete or something that is prepared with a bunch of documents together. Further advised in reviewing this document of more than 1,000 pages, was looking for technical issues, i.e. geo-composite material – what is it - did not find any specifics. Continuing, did not find any criteria as to the amount of oil that will be stored in the substation; 500 pages of phase 1, which is basically site assessment, all sorts of unnecessary data bases. Reiterated was specifically looking for a section of the foundation for the transformers which lay out what they are sitting on, and so forth; lengthy discussion ensued. Mr. Adib also questioned who will be monitoring this substation and expressed his opinion this is not a safe situation (referring to the magnetic field).

Kirsten Walker, 211 South Mountain Road: Directly across from the sub-station in Ernie Kovac's old house: Expressed concern over the potential of fire as house is made of logs and this is a major issue; concerned about the electrical fence around sub-station as her son runs towards it; also concerned about the effects of electric magnetic fields as has done research from the National Cancer Institute that state there are increased risks: Ms. Walker gave examples of same; further advised her son shows signs of autism and is wondering if this has had an affect; brief discussion ensued on how this sub-station can and does affect the lives of people.

Chairwoman Thormann expressed her opinion as there are outstanding issues, would prefer to continue the matter: Planning Consultant Geneslaw agreed and reiterated if the matter is not adjourned to a specific date and time, the hearing would have to be re-advertised.

Attorney Montalbano requested the public hearing be closed as they have to prepare responses to the comments raised; reiterated would prefer to have the public hearing closed, prepare the responses to the public comments for the Planning Board's review. Chairwoman Thormann advised is going to afford the public the opportunity to keep the public hearing open.

After a brief discussion, on a Motion of Yacyshyn, Seconded by O'Connor, and carried 7:0, with Ayes of Thormann, Heim, Streitman, Trevor & Blumenthal, **the matter was continued to date certain of June 6, 2012, at 7:30 p.m.**

POTENTA Environmental Consultants, LLC.
Engineers, Environmental Specialists

XPB, XST, XDEC, XBF, X7AMC/E, XJS, XJC, X Montalbano file

April 30, 2012

Ms. Shirley Thormann
Chairwoman-Planning Board
Town of Clarkstown
10 Maple Avenue
New City, New York 10956

RE: DEIS Technical/Substantive Review Comments on Noise Section-Little Tor Substation Project
Orange & Rockland Utilities, Inc.
Town of Clarkstown, Rockland County, N.Y.
PEC Project No. 11570

Dear Ms. Thormann:

This letter provides our Technical/Substantive Review comments on the noise assessment summarized in the SEQRA DEIS regarding the potential noise impacts of the proposed Little Tor substation project located in the Town of Clarkstown, New York.

The Completeness Review on the noise impact issues was conducted prior to acceptance of the DEIS document at the March 13, 2012 Planning Board meeting. The Applicant responded adequately to all the review comments on the noise study and included copies of requested data and related correspondence letters in the DEIS documents. The following Technical/Substantive Review comments related to the noise study summarized in the DEIS document are minor and intended for clarification to the Planning Board:

1) The summary text on noise impacts in the DEIS identifies (p. III.J-89) the local nighttime noise standard of 46dBA applicable to the project and accurately indicates that based on the tonal character of the noise produced by the proposed equipment sources onsite, the local standard will be lowered by 5dBA and the project must show compliance with a 41dBA sound level standard. Several times throughout the DEIS document the subsequent text conclusions indicate project compliance with the 46dBA nighttime standard. To avoid any confusion, the noise data provided indicates that the project will in fact comply with the noted lower 41dBA local nighttime standard recognized as applicable to the type of noise sources identified on the project site.

2) All the comment and response letters on the noise study are included in the DEIS Appendices -Volume II document. There was a recommendation that the Planning Board consider having an independent sound test conducted at the nearest affected residences (our December 20, 2011 comment letter) after all the equipment and recommended acoustical barriers were installed. On page III.J-94 of the DEIS and in their January 10, 2012 response letter, the Applicant agreed to conduct the sound test. To avoid any issue of potential conflict, note that it was suggested that the sound test be conducted by an independent consultant, meaning someone other than the Applicant's sound consultant, to be selected by the Planning Board to perform the test and ensure compliance with the local noise code.

166 Main Street, Flemington, New Jersey 08822 TEL. (908) 782-9716 FAX. (908) 782-2502

If you have any questions regarding the above comments on the DEIS documents, please do not hesitate to contact me.

Very truly yours,
POTENTA Environmental Consultants, L.L.C.

Edward J. Potenta, Principal
Institute of Noise Control Engineering-Member

cc: via email
R. Cautillo-Clarkstown
J. Simoes-Clarkstown
R. Geneslaw, AICP

POTENTA Environmental Consultants, LLC.

Engineers, Environmental Specialists

xRG
xPB, xJC, xDEC,
xEI, xDTA, xMontalbano
file

September 15, 2011

RECEIVED
SEP 14 2011
TOWN PLANNING DEPT

Ms. Shirley Thormann
Chairwoman-Planning Board
Town of Clarkstown
10 Maple Avenue
New City, New York 10956

RE: Comments on DEIS/Acoustical Impact Study
- Orange and Rockland Utilities, Inc.
Proposed Little Tor Substation Project
Town of Clarkstown, Rockland County, N.Y.
PEC Project No. 11570

Dear Ms. Thormann:

This letter report provides review comments on the noise sections of the SEQRA DEIS prepared by CMX dated April 2011 for the subject project including the technical noise report prepared by Ostergaard Acoustical Associates dated February 2010 regarding the potential noise impacts of the proposed substation to be located in the Town of Clarkstown, New York.

DEIS Report

The DEIS document text pp.I-5 and III.J87-92, summarizes the conclusions of the project noise report. Therefore any revisions to the technical noise report (in Appendix C) based on the applicant's response to comments below should be reflected in the above noted DEIS sections.

1) Page III.J-91-There is no detailed documentation provided in the DEIS/Appendix C for the noise mitigation analysis summarized in the DEIS text which recommends an 8-foot high noise barrier around the two gas regulators. Model input and output summary sheets supporting the recommended mitigation measure and sound reduction should be submitted for technical review.

Ostergaard Noise Report

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2) Page 5-The report should clarify what sources dominating the ambient measurements were included in the noise levels presented, whether they reflect the time period least affected by these

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identified extraneous sources or the average over the entire daytime and nighttime monitoring periods. The latter appears to be the case which might underestimate the project impact on the ambient nighttime conditions during the more sensitive 2-5AM period on weekends when fewer extraneous sounds affect ambient noise levels. The NYSDEC impact criteria should be addressed for ambient noise levels considering the existing character of the surrounding land use.

3) Page 22-The octave band standards in the local noise code are not provided in the report and should be presented in Table form for ease of comparison with Table 1 ambient level results and later reference for the project impact noise levels and assessment.

4) Page 24-The site modeling methodology describes the use of manufacturer's noise data for the transformer fans and actual measurements of the existing gas regulator units as input data for the proposed sources. This backup information should be included for the equipment sources in the technical report along with a discussion justifying use of the existing unit data for the proposed gas regulator model unit. It should also be clarified whether the noise measurements of the existing gas regulator were taken under maximum operating load conditions.

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9) Page 31-The assessment criteria for addressing acoustical impact is described as property line standards (Page 3) yet Figures 22-25 only provide the octave band analysis results and maximum SPL for the nearest residences (Sites L11-L14). Explain why the property line noise levels are not addressed in the impact assessment. Similar figures should be provided for both the property line receptors (L5-L10) for comparison with the local maximum and octave band noise standards

and for the measurement sites (L1-L4) for comparison with the ambient data and determination of receptor noise impacts. The graphics should present the local octave band standard as well.

10) Page 33-The supporting data for the mitigation analysis and the recommended noise barrier discussion included in the DEIS is not provided in the technical noise report in Appendix C (see DEIS Comment 1). The documentation should include both analysis input and output results indicating expected noise attenuation levels and a figure showing the recommended noise barrier locations and described orientation.

If you have any questions regarding the above review comments, please do not hesitate to contact me.

Very truly yours,
POTENTA Environmental Consultants, L.L.C.

Edward J. Potenta, Principal
Institute of Noise Control Engineering-Member

POTENTA Environmental Consultants, LLC.
Engineers, Environmental Specialists

RECEIVED
SEP 22 2011
TOWN PLANNING DEPT.

September 15, 2011

XST, XPB, XJS, XJC, XDEC, XBI, XDTA, X7A X Montalbano file

Ms. Shirley Thormann
Chairwoman-Planning Board
Town of Clarkstown
10 Maple Avenue
New City, New York 10956

RE: Comments on DEIS/Acoustical Impact Study
- Orange and Rockland Utilities, Inc.
Proposed Little Tor Substation Project (25B1)
Town of Clarkstown, Rockland County, N.Y.
PEC Project No. 11570

Dear Ms. Thormann:

This letter report provides review comments on the noise sections of the SEQRA DEIS prepared by CMX dated April 2011 for the subject project including the technical noise report prepared by Ostergaard Acoustical Associates dated February 2010 regarding the potential noise impacts of the proposed substation to be located in the Town of Clarkstown, New York.

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If you have any questions regarding the above review comments, please do not hesitate to contact me.

Very truly yours,
POTENTA Environmental Consultants, L.L.C.

Edward J. Potenta, Principal
Institute of Noise Control Engineering-Member

POTENTA Environmental Consultants, LLC.
Engineers, Environmental Specialists

December 20, 2011

RECEIVED
DEC 21 2011
TOWN PLANNING DEPT.

Ms. Shirley Thormann
Chairwoman-Planning Board
Town of Clarkstown
10 Maple Avenue
New City, New York 10956

RE: Comments on DEIS/Acoustical Impact Study
- Orange and Rockland Utilities, Inc.
Proposed Little Tor Substation Project
Town of Clarkstown, Rockland County, N.Y.
PEC Project No. 11570

Dear Ms. Thormann:

This letter report provides our summary review of the supplemental noise data provided by Ostergaard Acoustical Associates in their letter dated October 7, 2011, in response to our September 15, 2011 comment letter regarding the SEQRA DEIS and the potential noise impacts of the proposed substation project to be located in the Town of Clarkstown, New York.

The additional information provided included data concerning the technical mitigation analysis for the screening of the proposed gas regulators onsite from the near property lines and adjacent residential receptors, comparison of the projected impact on noise levels versus the local standards including the octave band noise levels, and an evaluation of the potential noise impacts versus ambient noise levels in accordance with the NYSDEC Program Policy for Assessing and Mitigating Noise Impacts (DEP-00-1, Feb. 2, 2001) under SEQRA regulations.

Mitigation Analysis Report

The mitigation study shows that the recommended U-shaped sound barriers surrounding the proposed gas regulators included with the project provides for adequate mitigation of the equipment noise levels to result in compliance of the site generated noise with the local octave band noise standards and the Rockland County noise standards at the site property lines and adjacent residences. The octave band noise level data provided in Attachment B Figures in the October 7, 2011 response letter clearly shows project compliance with the local noise ordinance with the proposed sound barrier mitigation in place. The data also shows compliance with the 41dBA sound level lowered 5dBA from the 46dBA local standard for the noted tonal character of the noise produced by the proposed equipment sources onsite.

Project Noise Impact versus Ambient Levels

In accordance with the NYSDEC program policy, the Figures in Attachment B of the October 7, 2011 response letter also provide a comparison of the projected noise levels versus the measured ambient noise. However, ambient noise levels for comparison with site generated noise impact levels should be free of influence from existing site equipment sources. Despite the

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fact stated in the DEIS documents that the minimum ambient nighttime noise levels at the near receptors along the North property line included effects of the existing gas regulator equipment onsite, the projected site generated noise levels with mitigation are shown to comply with the local noise code and are lower than both the nighttime ambient octave band and 41dBA noise levels recorded at the near receptor at Site L1. Based on the supplemental information submitted for review, it can be assumed that the nearby East property line receptor L2 (remote to the gas regulators) with a nighttime ambient noise level of 37dBA is free of influence from the existing site equipment noise (as shown in Figure 19, Appendix C-DEIS) and is more representative of the true ambient noise level near the North property line receptors. For that scenario, comparing the worst-case noise impact of the projected equipment noise level of 34dBA (with mitigation) at Site L16 on the North property line with the assumed 37dBA nighttime ambient noise level would result in less than a 3dBA increase in ambient noise at Site L16 described as "unnoticed or tolerable" noise impact, under 5dBA, referenced in Table B of the NYSDEC Program Policy.

Due to several factors including the complex site terrain, the equipment noise modelling procedures, and the need for sound barrier attenuation of the proposed equipment noise, it is recommended that the Town consider requiring the monitoring of project-generated site noise at the critical receptors to the North and West of the site as a condition of approval and issuance of a certificate of occupancy for the project site. The independent sound test should be performed after installation of the proposed equipment and recommended acoustical barriers is completed to ensure that the attenuated site noise levels will result in compliance with the local noise code and to verify the ambient noise assessment conclusions regarding the NYSDEC Program Policy.

DEIS Report

The DEIS text summarizes the conclusions of the project noise assessment and technical noise report included in Appendix C. The Town may wish to include revisions to the DEIS text and the technical noise report, as necessary, clarifying the results and conclusions of the project impact on ambient noise levels set forth in the NYSDEC Program Policy and compliance with the local noise code based on the responses reflected in the supplemental information submitted.

If you have any questions regarding the above review comments, please do not hesitate to contact me.

Very truly yours,
POTENTA Environmental Consultants, L.L.C.

Edward J. Potenta, Principal
Institute of Noise Control Engineering-Member

POTENTA Environmental Consultants, LLC.
Engineers, Environmental Specialists

XPB, XST, XDEC, XBF, X7AMCLE, XJS, XJC, X Montalbano file

April 30, 2012

Ms. Shirley Thormann
Chairwoman-Planning Board
Town of Clarkstown
10 Maple Avenue
New City, New York 10956

RE: DEIS Technical/Substantive Review Comments on Noise Section-Little Tor Substation Project
Orange & Rockland Utilities, Inc.
Town of Clarkstown, Rockland County, N.Y.
PEC Project No. 11570

Dear Ms. Thormann:

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POTENTA Environmental Consultants, L.L.C.

Edward J. Potenta, Principal
Institute of Noise Control Engineering-Member

cc: via email
R. Cautillo-Clarkstown
J. Simoes-Clarkstown
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POTENTA Environmental Consultants, LLC.
Engineers, Environmental Specialists

Faxed to RG
xRG
xPB, xJC, xDEC,
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File

September 15, 2011

RECEIVED
SEP 14 2011
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Town of Clarkstown, Rockland County, N.Y.
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5

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6) Page 26-The report states that manufacturer's noise data was used for modeling the impact of the proposed gas regulators which appears to be in conflict with the methodology described on Page 24 (see Comment 4) regarding the use of measurement data of the existing regulator onsite.

7) Page 28-The report should define emergency use of the second gas regulator and confirm that it would not involve use under heavy load conditions to reduce the strain on the other operating unit and result in both regulators operating simultaneously.

8) Page 28-No data was provided to review the projected octave band noise levels in comparison with the local standards to conclude project compliance. This information should be provided in graphics for all receptors analyzed showing comparison with the local octave band standards. No summary data for the projected L_{10} noise levels is provided for comparison with the ambient levels and the conclusion of receptor compliance with the Rockland County L_{10} noise standards.

9) Page 31-The assessment criteria for addressing acoustical impact is described as property line standards (Page 3) yet Figures 22-25 only provide the octave band analysis results and maximum SPL for the nearest residences (Sites L11-L14). Explain why the property line noise levels are not addressed in the impact assessment. Similar figures should be provided for both the property line receptors (L5-L10) for comparison with the local maximum and octave band noise standards

and for the measurement sites (L1-L4) for comparison with the ambient data and determination of receptor noise impacts. The graphics should present the local octave band standard as well.

10) Page 33-The supporting data for the mitigation analysis and the recommended noise barrier discussion included in the DEIS is not provided in the technical noise report in Appendix C (see DEIS Comment 1). The documentation should include both analysis input and output results indicating expected noise attenuation levels and a figure showing the recommended noise barrier locations and described orientation.

If you have any questions regarding the above review comments, please do not hesitate to contact me.

Very truly yours,
POTENTA Environmental Consultants, L.L.C.

Edward J. Potenta, Principal
Institute of Noise Control Engineering-Member

Continuing, Mr. Geneslaw advised when the plan is revised depicting the relocated driveway, suggested the applicant provide new photos showing the level of visibility from Little Tor Road. Mr. Geneslaw also inquired as to the risk of fire and explosion, and suggested the applicant provide both a brief explanation and follow up with a written explanation of the methods being incorporated.

Mr. Goldrick advised the controls in the stations are heavily monitored and more modern; detailed, lengthy, description ensued.

In summation, Mr. Geneslaw inquired if any other approvals, other than the Town and County, were required: Mr. Montalbano advised there are not; no Public Service approvals are required.

Town Planner Simoes, referring to the EAF, advised it refers to a cell tower and cell tower support building: the records show there are antennas on an O & R tower, and wanted this issue clarified for the record. Further inquired if the antennas are being moved, this might trigger additional permits. Mr. Goldrick confirmed the lattice tower is being removed and steel poles are being proposed to turn the line into the station; brief description ensued.

Continuing, Mr. Simoes inquired if any lights would be on and what visual impact, if any: Mr. Goldrick stated the lights would only be on if O & R was physically present at night for any reason; the site is not motion sensor; the camera system would trigger an alarm that would go back to the security center; no lights would come on if anyone or anything approached the fence; brief discussion ensued.

In summation, Mr. Simoes advised the applicant to comply with the Tree Preservation Law.

Chairwoman read into the record the following recommendations (see file): R. Haelen to A.L.C., dated 11/24/08; Rockland County Planning, dated 11/26/08; Rockland County Highway, dated 11/28/08.

Chairwoman announced call for Public Hearing: For the record, there were approximately 100 people in attendance for this item: Chairwoman stated all who wish to speak will be given an opportunity.

A list of persons wishing to be notified of future meetings is on file in the Planning Board office.

Resident on 290 South Mountain Road: Advised resides on Lake Lucille; against the application; expressed concern over run-off into Lake Lucille; expressed concern over the power lines going across Crum Creek; advised a pole is coming out of the concrete; expressed his opinion that application is being directed for Tilcon. Brief discussion ensued. Applicant advised will make a site visit and give the findings to Deputy Director of Environmental Control Dennis Letson.

Ray Amadi, 227 South Mountain Road: Read prepared statement into the record (see file, dated 12/3/08).

Ms. Darrow Lindburg, 211 South Mountain Road: Presented to the Planning Board photos and aerials of the site; petitions totaling over 320 signatures against the proposed

Continued

Box 178
New City, NY 10956

Emily King <emily@kingmichie.us> Sat, Jun 23, 2012 at 7:49 PM
To: s.thormann@clarkstown.org, a.gromack@clarkstown.org, j.simoes@clarkstown.org, a.mele@clarkstown.org, rgeneslaw@aol.com, 9-1@newcityfire.org

On Sat, Jun 23, 2012 at 7:48 PM, Emily King <emily@kingmichie.us> wrote:
> To: Shirley J. Thormann - Chairperson, Clarkstown Planning Board
>
> Dear Ms. Thormann, All Planning Board Members and Concerned Public Officials;
>
> (Ms. Thormann: Please give this email to all members of the Planning Board.)
>
> As a member of a Clarkstown family living in New City since 1955, I
> would like to strongly protest the siting of the new electrical
> substation where gas lines, streams and suburban housing all come
> together. The additional unknown factors in destruction of habitat and
> the impact of recreational vehicles on the stability of the gas lines
> gives cause for alarm already. It most decidedly does NOT inspire
> confidence that all safety precautions will always be met, and that no
> damage or destruction to homes and habitats will be the result of this
> foolish plan. Especially in light of recent substation fires,
> accidents and gas line breaks, including last week's nightmare in
> Nyack.
>
>
> The O&R DEIS should identify ALL potential problems/risks resulting
> from co-location and should identify if these safety precautions are
> already in place for the temporary substation that is located just a
> few yards away from the existing gas line regulator.
>
> What is your plan for what will happen if a fire starts at that site
> and spreads? Can New City's volunteer firefighters be expected to risk
> their lives for Orange & Rockland or whatever gas company will own the
> gas line in the future? Will Clarkstown reimburse families for the
> damage to their homes and property caused by explosion and forest
> fires?
>
> When the water used to fight those fires goes into the water table,
> what chemicals from firefighting and the utilities themselves will be
> released into the watershed for the Hackensack river?
>
> We have no answers to these questions, all of which stem from the
> central questions: who thought that this co-location was a good idea,
> how do they benefit from this plan that can cause so much destruction,
> and who will re-elect anyone who votes for it?
>
> Please consider all these factors and help the power companies find a
> less disastrous alternative location.
>
> Thank you.
>
> Emily King
> Box 178
> New City, NY 10956

Box 178
New City, NY 10956

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To: s.thormann@clarkstown.org, a.gromack@clarkstown.org, j.simoes@clarkstown.org, a.mele@clarkstown.org, rgeneslaw@aol.com, 9-1@newcityfire.org

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>
> Thank you.
>
> Emily King
> Box 178
> New City, NY 10956

Town of Clarkstown

Diane Papenmeyer <d.papenmeyer@clarkstown.org>

Fw: Fwd: Proposed substation

1 message

j.simoes@clarkstown.org <j.simoes@clarkstown.org> Fri, Jun 22, 2012 at 8:47 PM
Reply-To: j.simoes@clarkstown.org
To: Diane Papenmeyer <d.papenmeyer@clarkstown.org>

Another to print and file
Sent from my Verizon Wireless BlackBerry

From: nana59@aol.com
Date: Fri, 22 Jun 2012 17:49:10 -0400 (EDT)
To: <j.simoes@clarkstown.org>
Subject: Fwd: Proposed substation

-----Original Message-----
From: nana59 <nana59@aol.com>
To: s.thormann <s.thormann@clarkstown.org>
Cc: a.gromack <a.gromack@clarkstown.org>; j.simones <j.simones@clarkstown.org>; a.mele <a.mele@clarkstown.org>; rgeneslaw <rgeneslaw@gmail.com>; 9-1 <9-1@newcityfire.org>; martus <martus@granirer.us>; info <info@west-branch.org>; marvin <marvin@baumimagegroup.com>
Sent: Fri, Jun 22, 2012 5:47 pm
Subject: Proposed substation

Dear Ms. Thormann, and All Planning Board Members and Concerned Public Officials;

I am writing as a concerned citizen regarding the O & R Little Tor Substation that is proposed for the corner of Little Tor and South Mountain Roads. I live at 45 South Mountain Road, less than a mile from this site. As I'm sure you are well aware, there was a gas explosion in Nyack yesterday that caused a significant fire and as a result, a dangerous situation for people and property. This event occurred in as densely populated an area as the proposed O & R substation site indicated above. With two gas lines already running through this property, leaks can easily cause a catastrophic situation that will surely endanger the lives and homes of countless neighbors in the immediate vicinity.

Thus, I ask the following questions of you and the Planning Board Members:

- **If a fire like the one in Nyack occurs at the proposed substation site spreads, what plan is there in place to deal with such an event?**
- **Who will be responsible for replacing people's homes and their property? Will the homeowner and his/her insurance company be liable for dealing with what O & R has wrought in this scenario?**
- **Given how long this process of rebuilding and replacement can take, where would you propose that displaced residents should live in the interim?**
- **Who will replace burned trees, foliage, and in wildlife either killed or displaced by such a fire?**

- **In the event of such a scenario, what will happen to the water and dangerous material run-off that could easily pollute the West Branch stream, Lake Lucille and Lake DeForest reservoir?**

I recognize that O & R has to supply the Board with a supplemental environmental impact statement. I sincerely hope that all of my concerns and those of my neighbors will be addressed in regard to the questions I raise above and to the questions about EMF's that were raised at the recent public hearing.

Ms. Thormann, as I asked when I stood to speak at the last meeting, can you and the other Planning Board members, in all good faith say:

- ***You would like to and feel perfectly comfortable living with your family near this proposed substation?***
- ***You would like to and feel perfectly comfortable buying a house near this substation?***

Ms. Thormann: I would appreciate it if you would please give this email to all members of the Planning Board.

Sincerely,
Nana Koch, Ed.D
Associate Professor
Department of Health, Physical Education and Movement Science
Long Island University Post

45 South Mountain Road
New City, NY 10956
845-664-4125

~|~

Town of Clarkstown

Jose Simoes <j.simoes@clarkstown.org>

Fwd: IMPORTANT: South Mountain Rd power substation

1 message

gloria landman <zmsa@aol.com> Sat, Jun 23, 2012 at 9:45 AM
To: s.thormann@clarkstown.org, a.gromack@clarkstown.org, j.simoes@clarkstown.org, "a.mele "@clarkstown.org, rgeneslaw@aol.com, 9-1@newcityfire.org, martusgranirer.us.info@west-branch.org, marvin@baumimagegroup.com

-----Original Message-----
From: Terri Thal <thal.terri@gmail.com>
To: undisclosed-recipients:;
Sent: Fri, Jun 22, 2012 4:22 pm
Subject: IMPORTANT: South Mountain Rd power substation

Neighbors -

At the last public hearing on the proposed Little Tor Substation, the public was given 10 days to submit written comments. The deadline is tomorrow, Saturday, June 23, at 11:59 pm. The Planning Board insists on adhering to that deadline, so if you email, please do so by 11:55 pm.

Please look at the URL below. A gas line explosion happened in Nyack yesterday.

There already are two gas lines running through the proposed substation site. Also possible oil leaks.

http://nyack.patch.com/articles/portion-of-north-broadway-remains-shut-from-nyack-gas-line-accident

I am concerned about of the potential for fire disaster followed by water runoff going down the mountain, into the West Branch stream, Lake Lucille and further down into the Lake DeForest reservoir. I also am concerned about the Electro Magnetic Forces that will be emitted from the substation's electrical equipment and the existing power lines.

Whether or not you live in this neighborhood or even in Clarkstown, by the end of tomorrow, please send an email to the list at the bottom of this entire email. Please include the ccs.

Tell the Planning Board that you want, at minimum:

- **A plan for what will happen if a fire starts at that site and spreads.**
- **Who will replace people's homes and property? Are they supposed to pay for O&R's bad planning?**
- **Who will replace burned trees and wildlife?**
- **How will all the water that will run into the West Branch stream, into Lake Lucille and into the Lake DeForest reservoir be handled?**
- **How will the liquid runoff be separated from the dangerous materials that may be in it, so those materials don't flow into our streams, Lake Lucille and further down into the reservoir?**
- **A meeting of all parties and the public with a health professional who is an expert on EMFs, paid for by the Town. (We have recommended one)**

If you aren't yet scared enough to write a letter, see the following email Marvin Baum sent to the Clarkstown Planning Board:

Marvin Baum's most recent email:

Dear Ms. Thormann:

On June 14, 2012, I sent you a follow-up email that specifically addressed the potential dangers related to the proposed gas and electrical substations being co-located in New City. Here's what I said:

The first three attached documents talk about gas line explosions -- one massive deadly explosion in San Bruno, CA, in 2010, and ***one more recently on an O&R gas line in nearby West Haverstraw, which fortunately was not deadly because the homeowners weren't home at the time. The Haverstraw story demonstrates how easily something could (and did) go wrong because a utility contractor didn't follow proper procedures.*** *Given the inherent risks of explosion and fire that I've shown is possible at electrical substations (in my May presentation), the question needs to be answered by the DEIS about the cumulative risks of co-locating a gas regulator or gas substation at the same site, which could make the proposed project even more dangerous for the public's health and safety than each facility would do independently of the other.*

O&R's gas line explosion in Nyack has been all over the news today:
http://nyack.patch.com/articles/portion-of-north-broadway-remains-shut-from-nyack-gas-line-accident

I particularly urge you to watch the video on Patch.

Unlike the Haverstraw explosion, which was caused by a Verizon subcontractor, this accident was caused **directly** by an O&R contractor. **My foretelling words to you last week were that this "story demonstrates how easily something could (and did) go wrong because a utility contractor didn't follow proper procedures,"** which is exactly what happened just hours ago in Nyack.

Once again, we were extremely lucky that no one was killed, but as I said to you in an email yesterday before this accident occurred: **"do we wish to rely on luck and 'wishful thinking,' as evidenced by the failure of the Applicant to adequately address health and safety issues in their DEIS?"**

The flames from the Nyack explosion went more than two stories into the air. I believe the gas line at South Mountain Road is larger than the gas line in Nyack, and therefore might have an even greater potential for the size of explosion and flame height. **Does Clarkstown really want to take this kind of risk to public safety in a heavily-wooded residential neighborhood where a fire could easily get out-of-control?**

Through the public hearings and my follow-up emails, I've now identified multiple safety-related problems experienced by the Applicant in the past 2 years:

1) Nyack Gas Line Explosion (June 2012)
2) Dumbo Substation Explosion & Fire (April 2012)
3) Pleasantville Substation Explosion, Fire and Brush Fire (April 2012)
4) West Haverstraw Gas Line Explosion (January 2012)
5) Haverstraw Substation Explosion & Fire (August 2011)
6) Yonkers Substation Explosion & Fire (June 2010)
7) Bronx River Oil Spill Resulting from Yonkers Substation Fire (November 2009)
8) Yonkers Substation Explosion & Fire (November 2009)

While the Applicant says it has learned from prior accidents, clearly there is no shortage of new problems and/or "lessons not learned" from prior "events."

In doing some research, I came across another proposed O&R electrical substation that was to be co-located with a gas line. I don't think that substation was ever built, and **one of the technical reports identified a specific risk of co-locating these facilities, beyond the various issues I have already raised** -- one that would need special equipment to minimize the chances of an "event" on the gas line and careful, ongoing monitoring to make sure that the electrical substation equipment doesn't cause a problem with the gas line (my main focus, thus far, has been on an explosion at the electrical substation causing a secondary -- and perhaps even larger -- explosion at the gas substation, however this other "problem" would not necessitate an explosion at the electrical substation to cause havoc on the gas line).

The O&R DEIS should identify **ALL** potential problems/risks resulting from co-location and should identify if these safety precautions are already in place for the temporary substation that is located just a few yards away from the existing gas line regulator.

The danger to the community of the segmented approvals of the temporary substation and permanent substation in New City are now even further highlighted by O&R's accident in Nyack. **As of today, I still have not received the various documents from Clarkstown (in response to my FOIL request) that were withheld from Mr. Granirer's prior FOIL request. Mr. Maneri had one of those documents, a permit stating O&R could keep the temporary substation onsite until the new substation is built (which problematically assumes the proposed substation will be approved) at the June 6th meeting, so it's not an issue that the documents can't be found.** I fully expect that these withheld documents will be produced by Clarkstown, in accordance with the Freedom of Information Law.

Please distribute this email to all Planning Board members and make it part of the public record on the New City substation DEIS.

Thank you.

Sincerely,

Marvin Baum

==========

Neighbors:
Email addresses are below. Planning Board members other than the Chairperson don't have public email addresses. In your note, ask Shirley Thormann, Chairperson, to give the email to the other Planning Board members.

I suggest that you put only email addresses, not names, in the "To" box, and simply write as your salutation:

Dear Ms. Thormann, All Planning Board Members and Concerned Public Officials;

Then write:
Ms. Thormann: Please give this email to all members of the Planning Board.

Then write your letter.

Best,
Terri

Shirley J. Thormann - Chairperson, Clarkstown Planning Board s.thormann@clarkstown.org
Alex Gromack, Town Supervisor, a.gromack@clarkstown.or
Jose Simoes, Town Planner, j.simoes@clarkstown.org
Amy Mele, Town Attorney, a.mele@clarkstown.org
Bob Geneslaw, Planning Consultant, rgeneslaw@aol.com
Chief, New City Fire Department, 9-1@newcityfire.org
and cc:
Martus Granirer, West Branch Conservation Association, martus@granirer.us,
Terri Thal, West Branch Conservation Association, info@west-branch.org
Marvin Baum, marvin@baumimagegroup.com

I always thought that the planning board was there for our (residents of clarkstown)protection. After all to get a repair or improvement to our home, we have to jump through hoops and THEN be rejected. I GUESS I WAS WRONG.....

Terri Thal, MPA, Treasurer
West Branch Conservation Association
Rockland County's land trust, protecting land, waterways, biodiversity and the community's history and culture
100 South Mountain Road
New City NY 10956
845 634-3231 // info@west-branch.org

Town of Clarkstown

Jose Simoes <j.simoes@clarkstown.org>

South Mountain Substation Plan

1 message

William Michie <w.michie@att.net> Sat, Jun 23, 2012 at 10:53 PM
To: s.thormann@clarkstown.org, a.gromack@clarkstown.or, j.simoes@clarkstown.org, a.mele@clarkstown.org, rgeneslaw@aol.com, 9-1@newcityfire.org

Dear Ms. Thormann and all members of the Planning Board:
I understand you are considering giving a permit to have an electrical substation built in New City that is over a gas line and a stream that feeds into a local reservoir. The only sane response is, this is crazy.
We just saw a gas line explode in Nyack. It is neither uncommon nor unlikely. Why would you want to locate a substation near one? Such an action could only exacerbate the dangers inherent in gaslines, and the danger of water contamination makes this scenario even more unthinkable.
Please reject the application and at least try to find a better location.
Thank you,
Bill Michie
80 Sawmill Road, New City

Town of Clarkstown

Jose Simoes <j.simoes@clarkstown.org>

SouthMountain Road Power Substation

1 message

Janet Newman <janetnewman@optonline.net> Fri, Jun 22, 2012 at 10:30 PM
To: s.thormann@clarkstown.org

Dear Ms. Thormann, All Planning Board Members and Concerned Public Officials;

I have been living on South Mountain Road for 57 years, have seen many changes both good and bad, and now a threat to safety
of the neighborhood is being considered.
I am especially concerned about three potential dangers related to the proposed electrical substation:
1) Fire, 2) Run-off of dangerous material into the West Branch, and 3) Electro Magnetic Forces.

Please be sure these risks are thoroughly understood. Be sure that plans are made for WHATEVER IS REQUIRED to prevent their occurrence, and provisions for handling the disaster in case of accident.

I expect Ms. Thormann will send this message to all members of the planning board.

Thank you for your consideration.
Sincerely,
Janet Newman
46 SouthMountain Road

File
O&R
SUBSTATION

To: Town of Clarkstown
10 Maple Ave.
New City, NY 10956
Planning Board

Photography

S. Stava
251 South Mt. Rd.
New City New York
10956
914.720.7839

To Shirley Thormann:

I am a resident here on South Mountain Road whom had recently attended the planning board meeting
Regarding the substation that O&R is planning on erecting on the corner of my street and Little Tor. May I suggest that members of the Clarkstown Planning Board take a drive up to the site and sit in the driveway of the old Ernie Kovaks home (211 South Mountain Road?) directly across the street from the entrance in use by O & R where the alleged 'screening' fence was erected.
Just sit there with your window rolled down and listen. It is impressive.

Thank you,

Susan Stava

cc: Jose Simoes

Town of Clarkstown

Diane Papenmeyer <d.papenmeyer@clarkstown.org>

Fw: proposed sub-station site on South Mountain and Little Tor Roads

1 message

j.simoes@clarkstown.org <j.simoes@clarkstown.org> Fri, Jun 22, 2012 at 5:05 PM
Reply-To: j.simoes@clarkstown.org
To: Diane Papenmeyer <d.papenmeyer@clarkstown.org>

Another to print for Shirley and the file.
Sent from my Verizon Wireless BlackBerry

From: Eve Vaterlaus <eve@evevaterlaus.com>
Date: Fri, 22 Jun 2012 16:42:24 -0400
To: <j.simoes@clarkstown.org>
Subject: proposed sub-station site on South Mountain and Little Tor Roads

Dear Mr. Simoes,

I live near the proposed sub-station site on South Mountain and Little Tor Roads. Please consider the health of the residents and the health of the land before the wishes of the utility company. If, as I understand, this station is to make more power available for a specific industry, why place it on residential land? Surely another spot, non-residential and even closer to the end user, can be found if you try hard enough.

Families have moved to this area to be in natural surroundings, not to be threatened by disease, explosions, and pollution. I hope that they will not be bullied by the utility monopoly.

Eve Vaterlaus

Eve Vaterlaus
441 Buena Vista Road
New City, NY, 10956
845-323-4280
http://www.evevaterlaus.com

~|~

Debbie Tretola

From: Jose Simoes [j.simoes@clarkstown.org]
Sent: Wednesday, June 06, 2012 2:50 PM
To: Coffey, John
Cc: Anthony Montalbano; Lanza, Joanne
Subject: Re: Tertiary oil containment

The question that was raised by the public was how the material would dealt with once it reacted to oil in an "event." Would it be all dug up and replaced?

On Wed, Jun 6, 2012 at 1:54 PM, Coffey, John <COFFEYJo@oru.com> wrote:

Joe,

I misspoke yesterday when I stated that the oil berm around the station would **not** be of the geo composite material. The geo composite material will be placed above and below grade around the station to provide additional containment.

Sorry for the error.

John F. Coffey, P.E.

Chief Engineer - Transmission and Substation Engineering

Orange and Rockland Utilities, Inc.

390 West Route 59

Spring Valley, NY 10977-5300

845-577-3704

845-577-3720 Fax

coffeyjo@oru.com

~!~

x ST x RV x JS
x DEC x AM x PB
x BI x montalbano
File

June 21, 2012

RECEIVED
JUN 21 2012
TOWN PLANNING DEPT.

Town of Clarkstown Planning Board:
Shirley J. Thormann - Chairperson
Rudolph J. Yacyshyn - Vice Chairperson
Gilbert J. Heim, Jr.
Peter E. Streitman
Thomas A. Trevor
Mary Jane E. O'Connar
Mara S. Blumenthal
CC: Artie Kunz Jr., Chief, New City Fire Department
Jo Anne Pedersen, Superintendent of Parks
Alexander Gromack, Town Supervisor
Amy Mele, Town Attorney

Clarkstown Town Hall
10 Maple Avenue
New City, NY 10956

Also cc: James F. Hall, Ex Dir., Palisades Interstate Pk Com., Nita Lowey, Congressperson, Ed Day, Legislator, Kenneth Zebrowski, Assemblyman, Martus Granirer, West Branch Conserv. Assoc., Terri Thal, West Branch Conserv. Assoc., Marvin Baum

Dear Clarkstown Planning Board, Fire Chief, Superintendent of Parks, Town Supervisor, Town Attorney and Colleagues;

My husband, Martin Smith and I, Doris Laughton-Smith, live at 253 South Mountain Road, less than 1/10th of a mile from the proposed Orange and Rockland Electrical Substation, gas substation and cell tower. We recently moved to Rockland County from Colorado.

First, we would like to say that in our one-year search for a new home, we would never, ever have bought our present home if we had known these substations were going to be built so close to us. Martin is fighting cancer. We thought this was an ideal place to live. We did our due diligence, took precautions, such as testing our well water, which was very pure, but still we took more precautions by filtering it. We fell in love with the small mountain in our back yard, the lush country winding road feeling of South Mountain Road, its romantic artistic history and the peace of our home tucked up against High Tor Park. We thought it was clean country living, close to Manhattan, with all the conveniences of New City near by.

Ironically, amongst the many other reasons we moved back to the East Coast from Colorado was to get away from the devastating fires we experienced every 2-to-3 years of our 15-year residence there. Every one of the fires was declared the "once in only 100-years fire."

It is still quite difficult to speak about our experiences, so I am taking this opportunity to write to you each personally with hopes that we can paint a vivid picture of what it is like to be evacuated not only once, but twice, surrounded by six huge fires and then finally its

your turn to see your home on the evening news as the planes fly over, bombing it with red slurry or watch the helicopters with bladders sucking up lake or stream water and dropping it on your back yard in hopes of controlling a fire. We learned first-hand more than any lay-people ever needed to know about fires and fire safety regulations.

The first rule of fire is simple enough: it burns upward or uphill easily and swiftly. Light a match and hold it upward and it will burn. Turn it downward and it suffocates itself. In Colorado, we let the uphill fires just burn, including everything in its path, and built our defensive lines when the fire began to run its course downhill. On South Mountain Road, uphill from the proposed substation is a steep mountain covered with dead ash trees and broken timber from our recent September snowstorm. We have fuel, and lots of it. Have any of you walked South Mountain, High Tor or Harriman Parks lately? They are devastated with downed trees. I invite you to observe the difference from our back yard of groomed lawn, to the ominously dense piles of branches and trees that fall almost weekly just beyond our property line into the nature park. With a drought, wind and a substation spark let alone an explosion, you have the conditions for a "perfect fire."

We know defensive fire-lines are only lines dug in the sand, so to speak. One gust of wind on a dry day can blow sparks well beyond the line to start up a new and destructive race against the elements or it can spread under parched grass by its root system. Defensive lines can move by the hour depending on fuel, wind and how much retardant is applied. Water is a retardant, as are foam, slurry and similar substances. We need to plan for an unbelievable amount of water. We need many more hydrants on the uphill side of the mountain. Please don't be naïve and think there will never be a drought.

We have poison ivy climbing up the trees beyond our backyard, as thick as a muscleman's arm. When burned, it will cause poison ivy to enter your lungs. Do we want to subject our firefighters, our children and everyone else to this kind of deadly harm? Could we contain this smoke, which will get into our communities? Can anyone survive this? Do you imagine your airways closing?

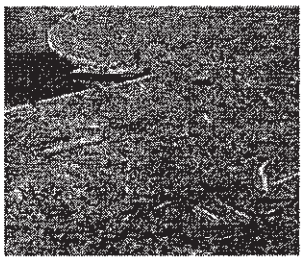
The second rule is that trees and flora burn white. This is clean smoke. Structures burn black. They are full of chemicals and these chemicals are toxic when inhaled. They are harmful to us. We all learned about this the hard way in the World Trade Center attacks. In Colorado, this is how we learned if our friends and neighbor's homes and businesses were burning, or just their back forty. A substation burning has got to be beyond toxic. Who will contain this smoke? Will there be pollution fines? When the winds are right, New Jersey oil refineries and factories are fined every time their fumes pollute Staten Island's air. Please don't let this happen here. Require far greater substantial fire-safety regulations.

Third, when this "perfect fire" is over on our drought-parched slopes of the mountains on the north side of South Mountain Road, it will be quite black, very quiet and altogether dead. No birds, no reptiles, snakes, no small mammals, foxes, deer, coyotes, bears, squirrels, rabbits or chip monks. No wild flowers, no native shrubs, mountain laurel and wintergreen berries, no 100-year-old trees dead or alive. It will solely be black and gray ash, which will smell like char for a long time. When the first rain comes, all the tiny bits of blackened debris and ash will wash down the mountainside because there is nothing to

stop it. The blackened rainwater will combine with the ash to make a nasty paste. There will be nothing to absorb this as it washes downhill, eroding and flooding our streams and filling Lake Lucile with tons of debris floating on its surface. This will probably kill any living thing in the lake for at least a year. You should require Orange and Rockland to include in its Supplemental EIS, a detailed analysis of the environment impact of a fire on 1,000 acres of South Mountain Park and High Tor State Park.

Recently, we built a 48' x 24' structure on our South Mountain property. The County required that we construct a dry well or like feature to collect rainwater from our new roof because it displaced the absorbing flora. Can anyone imagine all of High Tor without any water-absorbing vegetation? Please require effective and proper drain sewers along South Mountain Road. If we were required to deal with containing rainwater on our property for such a small structure at great cost to us, shouldn't Orange and Rockland be required to as well, while planning for an easily conceivable catastrophic fire. This will help direct this mess to a proper safer location. Currently, we have none.

I think we have more of the real picture now, but our most pressing questions are about the cost of defending such a fire and its after-damage. In Colorado, our personal, relatively small fire set by two boys cutting a class and smoking cigarettes in back of the school, where no structures were lost, cost at first estimates $2,200,000 to fight including USFS, state and county expenses. In the court cases that ensued over the next 5 years, costs including tax revenue losses, business losses, plus reduced value of surviving structures within the fire area rose to over $6,000,000-$7,000,000. We personally had unreimbursed expenses of $17,000. Our insurance covered $16,000 to have a crew of 8 clean every inch of our home and dry clean every piece of our clothing due to smoke damage, but only 20% of our landscape cleanup. We had at least five acres of charred tree remains to cut down and dispose of and red slurry staining everything for years. Our "Snaking Fire" was in April of 2002. In June, another fire started across the road, the "Hayman Fire," where the suppression cost was $42,000,000 but by the final tally of tax revenue loss, reduced home value, structures lost, etc., it rose to $207,000,000. www.wflcweb.org.



Fire debris floating on lake

Who would pay for such a fire here? Who will take responsibility for it? Orange and Rockland? Can they be sued if there is ever such a fire? Can the county sue them to recoup expenses? Can the state sue them to recoup expenses? Can the federal government sue them if their substation started such a hypothetical catastrophic fire? We would think Orange and Rockland would be making no end of effort to do everything possible to prevent this from becoming an issue at any cost.

Everything about fire is unpredictable and dangerous. Planning Board Chairperson, Thormann, stated that she spoke to the fire chief and he would never send his men into a dangerous situation. But we need to remind you all that four good firefighters died in a car accident driving to one our Colorado fires, six experienced firefighters lost their lives when the wind changed direction, one of our neighbors drowned when driving home from work along a road near a stream just like the one that runs along South Mountain Road on the first big rain after a fire, with no vegetation left to hold the water, the road flooded so fast that his Jeep SUV was swept away. One man committed suicide from remorse after he started a small fire with a spark from his ATV that burned several acres and someone's home. We had one death from asthma as well.

The corner of South Mountain and Little Tor Roads is a unique placement for this group of towers and substations for many reasons that have already been covered by others, but we did not think the topographical location was addressed in any of our meetings, and we attended them all.

Should you allow Orange and Rockland to continue, you will be placing large, potentially explosive structures at the base of a steep mountainous grade, with a 1,000+ plus acres of woodland containing masses of deadwood fuel with additional fuel from substantial grasses and shrub growth after our recent years of plentiful rainfall. We will be placing them not only on a lovely historic road, in a dense populated area, but also in the perfect place for the "perfect fire." Do you wish to make history this way? Is this the legacy you want for Clarkstown?

Lastly, we question how a 93-foot tower, substations and other structures will be camouflaged from "line of sight" as you drive down Central Highway toward Little Tor Road. Nowhere in the county do you have this spectacular view to Manhattan. It is another unique topographical phenomenon. This surely would not be allowed in Colorado or California. Line-of-Sight is a major forward thinking issue in this country today. Please be forward thinking. You will never be able to repair this in the future. Take the time to ride down Central Highway and enjoy the view now before it changes so drastically.

You must not only protect the citizens of Clarkstown from harm but you also have a responsibility to your parks and natural assets as well. Generations to come will thank you for your decision to find a better location for these three dangerous and controversial structures in our community.

Our county has a precious jewel here in the South Mountain road area; how can you let these substations exist in such an area? Is there no creative alternative? Why can't we expand the Tilcon substation instead of this one?

Summary of questions on:
Unique Topographical, Botanical, Wildlife, Native American and Paleolithic Issues:

- Unique combination of location and topographical conditions at a base of a mountain. Why are we not addressing the potentially "perfect catastrophic fire" conditions should we go into a drought? One added fire hydrant is hardly sufficient.

- We also need a greater addition of sewer drains should a fire occur or quantities of water are used for oil spills, etc. Why do we not have Sanitary Sewer Maintenance Department reports on this?

- Do we have an evacuation plan for an explosion or fire?

- Should there be a fire, who will pay for repression costs, clean up, loss of tax revenues, further depreciation of property values, medical bills, moving expenses?

- We need a Botanical and Wildlife Environmental Impact Evaluation, should there be a major fire on the mountainside?

- Most states require Native American and Paleolithic impact studies should you care about disturbing our precious historical sites.

- Unique line-of-sight from the top of Central Highway to Manhattan should be unobstructed by a cell tower and substations. How will we camouflage these?

- Why is Verizon putting a cell tower at the base of a mountain? For best service, cell towers should be located at the highest, never at the lowest point. What are the politics behind this?

We respect the time and effort you have given to this matter over the months. Please be ultra-wise in your decision. Think of the future and the legacy that you will leave to Clarkstown in the generations to come. Please read the attached letter and enter into the record of comments
Sincerely,

Doris Laughton-Smith
Martin L. Smith
253 South Mountain Road
New City, NY 10956
H: 845 708 5098
F: 845 708 5547
M: 845 708 9813
Art@dorislaughton.com
ww.dorislaughton.com

Debbie Tretola

From: Jose Simoes [j.simoes@clarkstown.org]
Sent: Tuesday, May 22, 2012 3:31 PM
To: epotenta@potentaenvironmental.com; epotenta@aol.com; m.leifer@clarkstown.org; d.letson@clarkstown.org; jscoyle@coyleandcoyle.com; rgeneslaw; Anthony Montalbano
Subject: Fwd: South Mountain Road Substation update
Attachments: Transcript_w_errors_PB-Hearing-5-2-2012.pdf

FYI

---------- Forwarded message ----------
From: <shirlasker@aol.com>
Date: Tue, May 22, 2012 at 2:47 PM
Subject: Fwd: South Mountain Road Substation update
To: Jose Simoes <j.simoes@clarkstown.org>

Begin forwarded message:

From: Terri Thal <thal.terri@gmail.com>
Date: 20 May 2012 10:40:15 PM EDT
To: undisclosed-recipients:;
Subject: South Mountain Road Substation update

Dear Neighbor -

Government bodies seldom extend public hearings. As I told you last week, the Clarkstown Planning Board extended until June 6 its hearing on the proposed expansion of O&R's South braised questions that Planning Board members thought were worth pursuing.

The transcript of that meeting is attached. (We spotted some errors—see the end of this note—and there may be more.) Here are some highlights of the transcript:

We spoke about:
▪ ***Fire.*** We showed videos of huge fires in similar Con Ed-owned substations, including two blazes that had occurred just days before the hearing.

▪ ***Possible oil leaks; storms and flooding.*** Substation equipment almost always leaks oil. Spills are more likely than not. If leaks occur, the oil easily could enter the West Branch stream, flow into—and pollute—Lake Lucille and continue farther downstream in the Hackensack River. In the Draft Environmental Impact Statement (DEIS), O&R wrote about the material it plans to use to contain oil spills. It's said to turn oil to a jelly that doesn't wash away. But O&R never named that material, thereby preventing us from learning more about it. We found one likely product but it seems to be a one-shot material. Even the smallest oil discharge can activate it and thereby disable the system.

▪ ***Reduced property values.*** We contested O&R's statement that properties near the substation would not decrease in value. We cited examples of properties near substations and power lines that had diminished in value.

▪ ***Visibility of the substation on a historic road.*** We displayed O&R's photo-simulations showing trees that purportedly would hide some of the substation equipment. We noted that those trees would have to be 50 years old to be as high and dense as shown in O&R's renderings. O&R also showed trees under the power line. Under interstate regulations, O&R would be required to cut these down! We demanded to see what the plant would look like from the road in five years, not 50, with a legal landscaping plan.

▪ ***The electromagnetic forces that would be emitted.*** O&R provided no information about the offsite strength of electromagnetic forces that would be emitted by the substation. We discussed the public health danger of those emissions.

The Planning Board directed O&R to bring more information about several of these issues to the June 6 hearing.

The Planning Board seemed impressed by our plan to retain a consulting firm to predict the electromagnetic forces the substation will emit. We've done that. It costs a substantial amount of money.

I'll send more information on that.

We also talked about Clarkstown's segmented review: O&R plans to build or expand 27 substations in the region, but Clarkstown is considering the environmental impact of *only* the substations being built in the town. And, even those are being considered as independent, not related, sites. SEQRA requires the reviewer to consider the impact of the entire project, not just of individual segments that separately seem less harmful than if they are considered together.

Cordially
Terri -

Errors in the transcript:

- My name is Terri Thal, not Terry Thaw.
- The engineer is Fuad Adib, not Furad Adip.
- Martus Granirer did not say that if the project goes through he will sell his house; William Terribile said that.

If you have any question, please call or email. If you send an email and I don't respond, please send me a note or call and leave a message on my voicemail. (Some email, even from people I correspond with often, has been bouncing into Spam. I should have that cleared up soon.)

Terri Thal, MPA, Treasurer
West Branch Conservation Association
Rockland County's land trust, protecting land, waterways, biodiversity and the community's history and culture
100 South Mountain Road
New City NY 10956
845 634-3231 // info@west-branch.org

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All postings to Rockland Water Coalition list are private and for list members only. Please do not forward any postings from the water coalition list to other lists or to non-list members.- Thank you.

Viist our website: www.sustainablerockland.org

~!~

Town of Clarkstown

Jose Simoes <j.simoes@clarkstown.org>

Comments on DEIS for Little Tor Substation

1 message

Terri Thal <thal.terri@gmail.com> Sat, Jun 23, 2012 at 8:55 PM
To: Shirley Thormann <s.thormann@clarkstown.org>, a.gromack@clarkstown.org, Jose Simoes <j.simoes@clarkstown.org>, a.mele@clarkstown.org, rgeneslaw@aol.com, shirlasker@aol.com, martusg@gmail.com, Marvin Baum <marvin@baumimagegroup.com>, marzie jafari <marzie2006@gmail.com>, Terri Thal <thal.terri@gmail.com>

Ms. Thormann;

Please include the two attached letters into the comments on the DEIS for the proposed Little Tor Road substation; and please give copies of them to all members of the Town of Clarkstown Planning Board.

Thank you.

Terri Thal

--

TERRI THAL
8 Lake Road
New City, New York 10956-4409
845.634.3231

Terri Thal, MPA, Treasurer
West Branch Conservation Association
Rockland County's land trust, protecting land, waterways, biodiversity and the community's history and culture
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New City NY 10956
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2 attachments

Ltr-DEIS_T-Thal_6-22-2012.doc
33K

Ltr_on_DEIS_M_Jafari.doc
25K

June 22, 2012

Shirley J. Thormann - Chairperson, Town of Clarkstown Planning Board
Rudolph J. Yacyshyn - Vice Chairman, Town of Clarkstown Planning Board
Plannning Board Members
Gilbert J. Heim, Jr.
Peter E. Streitman
Thomas A. Trevor
Mary Jane E. O'Connar
Mara S. Blumenthal

cc
Alex Gromack, Town Supervisor,
Jose Simoes, Town Planner,
Amy Mele, Town Attorney,
Bob Geneslaw, Planning Consultant,
Shirley Lasker, Town Councilperson concerned with environment
Martus Granirer, West Branch Conservation Association, ,
Terri Thal, West Branch Conservation Association,
Marvin Baum

Dear Ms Thormann,

Please give copies of this letter to all other members of the Town of Clarkstown Planning Board.

I am contacting you to express my concerns regarding the O&R proposed Little Tor substation. I live at 151 South Mountain Road in New City. I have a doctorate degree in Earth and Environmental Sciences, and I feel responsible to share my professional opinion with the community.

I ask the Planning Board to commission a Health Risk Assessment, which will study all risk factors of the proposed substation (not just EMFs) in a holistic approach. Risk Assessment is the current scientific tool to present estimates of risk. In its Draft Environmental Impact Study, O&R claims that there is no need for an inclusion of Health Risk Assessment. One may argue that the amount of EMFs is below the threshold, therefore there will be no risk. While the argument might be accurate for a single factor, the reality is very different when you add up all health risk factors (e.g. high voltage, oil, water contamination, etc.).

O&R's plan will expose the public to some amount of each of these risk factors. Each of these factors is well known for having direct correlation with many types of cancers, health issues, disabilities, etc. Public health researchers/scientists can determine the weight factor for each one, and then, by using statistical and spatial analysis and methodologies they will be able to calculate the overall risk factor.

It is extremely important that the Planning Board not only commissions a Health Risk Assessment, but also that its scope (again, all elements such as EMF, high voltage, oil, etc as well as the methodologies) is clearly described. I cannot stress this matter enough.

O&R should be required to include in the Supplemental DEIS how the study was conducted, where the significant or sensitive archeological resources probably are, how it intends to find them, how it will mitigate any damage that might come to them from its work.

The DEIS states (pages III.K-96 & 97) that "no significant national or cultural resources are present within or adjacent to the APE." [Area of Potential Effect] It also states that "RGA (Richard Grubb and Associates, a consulting firm) reports that due to the proximity of known prehistoric resources, topographic setting and distance from water the APE has a *high potential for containing prehistoric archeological resources*" and that "given the proximity of this site to the Hackensack River, the general topography, the presence of other although not significant historic resources in the area and the presence of map-documented structures within the APE, *the sensitivity for historical archeological resources is considered high.*" [my emphasis]

Yet, O&R's section on Mitigation Measures (page III.K-97) says only that "there will not be any significant environmental impacts upon *cultural resources*." And in the Introduction/Executive Summary, on page I-6, it says, "...This study concludes based on a detailed review of significant data *that the site may contain Historical or Archeological significant resources*. For that reason a Phase IB study was performed. This study concluded that the project as proposed will not have any significant averse environmental impacts upon *cultural resources*." [My emphasis]

Cordially,

Terri Thal, MPA

TERRI THAL 8 LAKE ROAD NEW CITY, NY 10956 845.634.231 thal.terri@gmail.com

June 22, 2012

Shirley J. Thormann - Chairperson, Town of Clarkstown Planning Board
Rudolph J. Yacyshyn - Vice Chairman, Town of Clarkstown Planning Board
Plannning Board Members
Gilbert J. Heim, Jr.
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Mary Jane E. O'Connar
Mara S. Blumenthal

cc
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Jose Simoes, Town Planner,
Amy Mele, Town Attorney,
Bob Geneslaw, Planning Consultant,
Shirley Lasker, Town Councilperson concerned with environment
Martus Granirer, West Branch Conservation Association, ,
Marvin Baum

Dear Ms Thormann,

Please enter this letter in the comments on the Little Tor Road Substation DEIS; and please give copies to all members of the Town of Clarkstown Plannng Board.

- *The Supplemental DEIS should contain an analysis of potential environmental impacts and a mitigation plan should a fire spread from the substation site to the mountainside across the road and to the east and west.*

  Everything that runs off South Mountain Park and High Tor State Park winds up in watercourses. If a fire occurs, or if quantities of water are used for oil spills, massive amounts of runoff, some containing debris, will run off the mountains. Some runs into storm sewers; some runs directly into the watercourse. Everything west of or across from Lake Lucille will flow into West Branch Stream or Lake Lucille, increasing the amount of silt in Lake Lucille; it will continue downstream and into the reservoir. Everything east of Lake Lucille will go directly into the stream and then into the reservoir. We need more than more storm sewers; we need *a process that separates the water runoff from the silt and the harmful products produced by fire and from fire-fighting*. None of this has been addressed in the DEIS--and should be included in the Supplemental DEIS.

- *The DEIS ignores O&R's own consultant's reports on archeological resources.* As Pages III.K-96 & 97 of the DEIS show, archeological and cultural resources are quite different. The DEIS pretends that the consultant's report that there will be no significant environmental impacts on *cultural resources* encompasses its findings that there will be significant or sensitive *archeological resource.* This is deliberate obfuscation by O&R.

I have used these statistical analyses in my field of research. The Health Risk Assessment must be conducted by a public health scientist.

Please include this statement in the public comments about the Little Tor Substation DEIS. Please include a requirement for this study in the Supplemental DEIS.

Thank you for your hard work.

Marzie Jafari, Ph.D.
Professor and Dean
Lehman College, The City University of New York
marzie2006@gmail.com

Town of Clarkstown

Jose Simoes <j.simoes@clarkstown.org>

Fwd: O&R Proposed Substation

2 messages

Terri Thal <thal.terri@gmail.com> Sat, Jun 23, 2012 at 11:45 PM
To: Shirley Thormann <s.thormann@clarkstown.org>, a.gromack@clarkstown.org, Jose Simoes <j.simoes@clarkstown.org>, a.mele@clarkstown.org, rgeneslaw@aol.com, shirlasker@aol.com, martusg@gmail.com, Marvin Baum <marvin@baumimagegroup.com>, Terri Thal <thal.terri@gmail.com>

Ms. Thormann;

Please include the following letter in the official comments about the Little Tor Road substation DEIS; and please give copies to all members of the Town of Clarkstown Planning Board.

Thank you.
Terri Thal

Dear Mr. Geneslaw,

Following please find a summary of my comments related to the deficiencies of the project's DEIS submitted by O&R to be addressed in the supplemental DEIS:

1. DEIS Structure: The existing DEIS (DEIS) is a flat compilation of many documents. The needed information cannot be easily found and reviewed. Crucial information may be overlooked. I request that the supplemental DEIS should have a 2-page Executive Summary that offers the crucial information requested by the public and discussed later in sections. The less relevant documents like a 500-page database search should go to appendix.

2. Justification of Need: DEIS did not include specific justification as to why the substation is necessary instead had general reference that consumption has increased. O&R should provide specific information like " Property X with electric consumption amount of Y is added to the system. Therefore the substation is necessary".

3. Oil Storage: DEIS did not include the amount of oil handled/kept at the site. It is crucial that the public knows this amount.

4. Geocomposite Material: DEIS did not reveal the type and specification of the geocomposite material.

5. Construction Details: DEIS did not provide a plan with sections showing the foundation structure of the transformers, the protective layers, etc. instead several electrical drawings were provided that could not be used for understanding the project specifics.

6. Release of Contaminants: According to USEPA and NYSDEC, Water Quality in Clarkstown is considered worst than national average due to more than national average contaminated sites within Clarkstown that release dissolved phase contaminants to groundwater or surface waters. Given the positive exposure of the facility to precipitation, DEIS does not include protective measures against transport of dissolved contaminants from the site to surface waters and groundwater. It discusses several physical barriers, none capable of withholding dissolved pollutants.

7. Fires: The substation contains 3 hazardous elements namely gas, electric and oil. Within the life span of the substation, at least one fire is likely to occur. DEIS does not discuss the protective measures against spread of fire in a densely wooded area instead it relies on local fire control facilities.

8.Electromagnetic Field: DEIS does not have an assessment of the health stress in the communities around substations instead declares that EMF levels are below state threshold. DEIS should recognize that even perception of danger is a serious factor causing unease in the population.

I appreciate the opportunity of providing you my comments.
--
Regards,

Fuad F. Adib, Ph.D., P.E.,
Applemon Corporation
151 South Mountain Rd
New City, NY 10956
Phone: (845) 634-0858
Fax: (845) 634-7398
Cell: (845) 367-1917

Visit us at www.applemon.com

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845.634.3231

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Rockland County's land trust, protecting land, waterways, biodiversity and the community's history and culture
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New City NY 10956
845 634-3231 // info@west-branch.org

---

rgeneslaw <rgeneslaw@aol.com> Su
To: j.simoes@clarkstown.org

Joe, To be included in the O & R record. Bob.

Robert Geneslaw Co.
Planning and Development Consultants

Robert Geneslaw, AICP
368 New Hempstead Rd #320
New City, NY 10956
Office (845) 368-1785

Fax (845) 368-1787
RGeneslaw@aol.com

The contents of this message, together with any attachments, are intended only for the use of the individual or entity to which they are addressed and may contain information that is privileged. If you are not the intended recipient, you notified that
any dissemination, distribution, or copying of this message, or any attachment, is strictly prohibited. If you have received this message in error, please notify the original sender or Robert Geneslaw Co.(Tel: 845 368-1785) Email: RGeneslaw@aol.com) immediately and delete this message, along with any attachments, from your computer. Thank you.

---------- Forwarded message ----------
From: "Fuad Adib" <fuadib@applemon.com>
To: rgeneslaw <rgeneslaw@aol.com>
Cc:
Date: Sat, 23 Jun 2012 22:58:36 -0400
Subject: Fwd: O&R Proposed Substation

Dear Mr. Geneslaw,

Following please find a summary of my comments related to the deficiencies of the project's DEIS submitted by O&R to be addressed in the supplemental DEIS:

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Regards,

Fuad F. Adib, Ph.D., P.E.,
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Phone: (845) 634-0858
Fax: (845) 634-7398
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Visit us at www.applemon.com

Town of Clarkstown
Department of Environmental Control

INTER-OFFICE MEMORANDUM

November 25, 2008

FROM: Ronald Haelen, RLA, Environmental Resource Specialist

MEMO TO: ALC

RE: O&R substation –proposed upgrade of electrical substation

SEQR @ PRELIMINARY review

COMMENTS:

OK 1. Provide a detail of the light fixtures. The fixtures appear to be angled sideways instead of straight down. To help prevent light glair the fixtures should be mounted 90 degrees to the pole.

OK 2. The light fixtures on the 60-foot poles should be used only when necessary – during emergencies or night maintenance and repairs. Considerations should be made to have some of these lights on a motion sensor for security purposes.

We'll look 3. Additional trees along the "NYSDEC Pocket Pond" are shown in 2-4' of fill and will probably not survive.

OK 4. Tree removal plan should include a chart with the number of trees to be removed and to remain.

OK 5. Some of the evergreen trees along South Mountain Road should be increased in size from 7-8' to 8-10'

OK 6. Indicate type and size of proposed fence.

OK 7. Identify the rectangular block symbols along the northern edge of the proposed structures.

OK 8. Verify if there is enough room to pull a large service vehicle off the road and open the gate without interfering with traffic on Little Tor Road.

OK 9. Landscape, Lighting and Building plans to be submitted to ALC for review and approval.

P.B. Mtg.
6/13/12

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Final AC ELF Simulation Emission Report
Subject: Final AC ELF Simulation Emission Report – Orange & Rockland Proposed Little Tor Substation Project for Lines #530 & #541 in Clarkstown, New York

Dear Mr. Granirer,

VitaTech Engineering was commissioned to simulate the magnetic flux density levels emanating from the proposed Little Tor Substation to be located at the intersection of South Mountain Road and North Little Tor Road in Clarkstown, New York. The Little Tor Substation will be outfitted to the existing pair of 138 kV transmission lines (Lines #530 & #541, traveling to Spring Valley and West Haverstraw) which bisect the site, as outlined in the drawings provided by the utility company. The proposed Little Tor Substation would convert the incoming 138 kV power to 13.2 kV electrical power through a pair of 50-MVA transformers, then would step-up the converted 13.2 KV electrical power through a single 25-MVA transformer to replace the current 34.5 kV sub-transmission line source(s). As shown in the service drawings, the Little Tor Substation will be an outdoor facility to be outfitted with new buswork, switchgear equipment and switchyard cables, which were modeled within the simulation emission profiles.

The objective of the simulation emission profiles was to identify the peak simulated magnetic flux density levels from the proposed electrical equipment within the future Little Tor Substation and to identify the increase in expected magnetic flux density levels around the site. A series of simulated emission profiles were conducted at typical worst-case loading, implemented as 75% conditions throughout most of the report (particularly for the rated systems, such as the 50-MVA / 25-MVA transformers and output sections).

Electromagnetic Interference (EMI)
Electromagnetic induction occurs when time-varying AC and DC magnetic fields couple with any conductive object including wires, electronic equipment and people, thereby inducing circulating currents and voltages. The magnetic fields most people are familiar with emanate from unshielded (susceptible) electronic equipment (computers monitors, video projectors, computers, televisions, LANs, diagnostic instruments, magnetic media, etc.) and

signal cables (audio, video, telephone & data), electromagnetic induction generates electromagnetic interference (EMI), which is manifested as visible screen jitter in displays, hum in analog telephone/audio equipment, lost sync in video equipment and data errors in magnetic media or digital signal cables.

Generally, for AC ELF sources, the minimum EMI threshold is 10 milligauss (mG) in unshielded electronic equipment, especially in 14- to 17-inch color computer monitors and analog signal cables; however, the AC ELF EMI threshold for high-resolution 17- to 21-inch color monitors is only 5 mG. Actual AC ELF EMI immunity depends on the PCB and component layout, circuit design (differential verses unbalanced input amplifiers, signal-to-noise ratio, etc.), outer case composition, geometry and shielding factor (SF). ***Liquid Crystal Display (LCD's) monitors and LCD projects are not affected (susceptible) by AC ELF magnetic fields at any levels.***

However, for long-term human health exposure in occupied areas such as a residence or work desk, the recommended EMI threshold of 10 mG has been proposed by the National Council of Radiation Protection as a safe and reasonably achievable threshold for radiated time-varying AC ELF magnetic flux density levels. **As the future Little Tor Substation is an additional source of electromagnetic interference, this susceptibility standard was implemented into the formal recommendations for the site and surrounding areas.** *It is important to remember that magnetic flux density susceptibility can be specified in one on three terms: Brms, Bpeak-to-peak (p-p) and Bpeak (p). The simulation software presents each emission profile in units of milligauss, RMS (Brms). However, one can easily convert RMS to peak-peak or vice-versa using a simple formula. The typical conversion from peak-peak to RMS for AC ELF sine waves is a factor of 2.8 (divide peak-peak by 2.8 to calculate RMS).*

For example, the Brms susceptibility standard of 10 mG for long-term human health exposure can be expressed as follows:

$$Brms = 10\ \text{mG} = \frac{Bp-p}{2\sqrt{2}}$$

Solving for Bpeak-to-peak:

$$Bp-p = 28.3\ \text{mG}$$

Simulation Review

The simulated emission profiles include the following equipment or source(s):

- The existing 138 kV Orange & Rockland Transmission lines, specifically Lines #530 and #541, as indicated within the utility documents

- The 138 kV Primary Switchyard and Feeders to the Associated Transformers
- Two 50-MVA (50,000 kVA) Substation Transformers, 138 kV/13.2 kV

- One 25-MVA (25,000 kVA) Substation Transformer, 13.2 kV/34.5 kV

- Proposed 34.5 kV Sub-Transmission Line Service and Switchyard Conduits

- Proposed 13.2 kV Underground Distribution Lines, energized by the Substation Switchgear operating at 13.2 kV

- The simulation also implements the proposed steel pole(s) to be used at the disconnect points adjacent to the future Little Tor Substation

Figures #1 & #1A, Proposed Little Tor Substation, present the simulation emission profile for the Proposed Little Tor Substation at the standard typical worst-case loading condition of 75%. The simulation was conducted at even grade and at 1-meter in elevation (all plan-view simulations within the preliminary simulation report are conducted at 1-meter in elevation; all cross-section simulations are conducted at the cut-through indicated in the lower right-hand corner).

The Proposed Little Tor Substation as presented in Figure #1 includes only the electrical equipment models for the proposed Little Tor Substation Items (no transmission/distribution/underground lines leaving the substation included), as shown in the information pane on the right-hand side of the Figure.

At 75% Load, the 138 kV disconnects from each transmission lines are simulated at 156.9 amps to the switchyard poles at a total elevation of 16.7 meters. The lines drop into the switchyard (at a total elevation of 4.6 meters) and feed each of the 50-MVA transformers, programmed at 138 kV/13.2 kV, allowing an output current of 1640.2 amps per transformer. The double-ended tandem substation switchgear, operating at 13.2 kV, is programmed to the output current of 1640.2 amps per end, and ultimately feeds the 25MVA sub-transmission transformer (located in the lower-right-hand corner of the substation at plan-view), programmed to operate at 13.2 kV/34.5 kV. For this pair of simulations, the electrical equipment casing was modeled as a comparison between standard-clad -3 dB attenuation, which provides roughly 30% shielding (Figure #1) and heavy-clad -20 dB attenuation, which provides roughly 90% shielding (Figure #1A).

As shown by Figures #1 & #1A, simulated magnetic field emissions are roughly 1 mG in magnitude at the Hackensack River using -3 dB (and 0.5 mG and less using -20 dB), which is the bordering boundary to the adjacent areas of the proposed Little Tor Substation.

Figures #2 & #2A, Proposed Little Tor Substation, present the simulation emission profile for the Proposed Little Tor Substation at the standard average loading condition of 50%. The simulation was conducted at even grade and at 1-meter in elevation (all plan-view simulations within the preliminary simulation

report are conducted at 1-meter in elevation; all cross-section simulations are conducted at the cut-through indicated in the lower right-hand corner).
The Proposed Little Tor Substation as presented in Figure #2 includes only the electrical equipment models for the proposed Little Tor Substation Items (no transmission/distribution/underground lines leaving the substation included), as shown in the information pane on the right-hand side of the Figure.

At 50% Load, the 138 kV disconnects from each transmission lines are simulated at 104.6 amps to the switchyard poles at a total elevation of 16.7 meters. The lines drop into the switchyard (at a total elevation of 4.6 meters) and feed each of the 50-MVA transformers, programmed at 138 kV/13.2 kV, allowing an output current of 1093.4 amps per transformer. The double-ended tandem substation switchgear, operating at 13.2 kV, is programmed to the output current of 1093.4 amps per end, and ultimately feeds the 25-MVA sub-transmission transformer (located in the lower-right hand corner of the substation at plan-view), programmed to operate at 13.2 kV/34.5 kV. For this pair of simulations, the electrical equipment casing was modeled as a comparison between standard-clad -3 dB attenuation, which provides roughly 30% shielding (Figure #2) and heavy-clad -20 dB attenuation, which provides roughly 90% shielding (Figure #2A).

As shown by Figures #2 & #2A, simulated magnetic field emissions are roughly 0.6 mG in magnitude at the Hackensack River using -3 dB (and 0.4 mG and less using -20 dB), which is the bordering boundary to the adjacent areas of the proposed Little Tor Substation.

Figures #3 - #3C, Proposed 138 kV Transmission Lines #530 & #541, present the simulation emission profile for the proposed 138 kV transmission line section adjacent to the future Little Tor Substation at various loads. The simulation was conducted at even grade and at 1-meter in elevation.

As shown on Figure #3, the existing 138 kV Orange & Rockland #530 & #541 Transmission Lines were modeled to accommodate the future Little Tor Substation, including the proposed steel pole tower configuration as shown within the study. (To be specific, the tower phase elevations were modified from 22.5m, 20m, 17m to 23.3m, 20.3m, 17.3m, respectively, for the pair of proposed steel pole towers adjacent to the site).

The tables below summarize the 138 kV Transmission Line simulations by Figure:

Fig #	Transmission Line System Load	Transmission Line Current Load	Transmission Line Phasing Used
3	600 MVA Total	941 Amps per Line	Standard
3A	200 MVA Total	314 Amps per Line	Standard
3B	200 MVA Total	314 Amps per Line	Split-Reverse
3C (CS)	200 MVA Total	314 Amps per Line	Standard

Table #1, 138 kV Transmission Line Simulation Emission Profiles

Fig #	Peak Magnetic Field Under Line (at 1-meter)	Magnetic Field in Center Substation	Magnetic Field at N. Little Tor Rd.
3	84 mG	10 mG	0.5 mG
3A	27.5 mG	3 mG	0.2 mG
3B	26.5 mG	3 mG	0.2 mG
3C (CS)	27.5 mG	3 mG	0.2 mG

Table #2, 138 kV Simulated Magnetic Field Levels at 1-Meter in Elevation

Figure #4, Proposed 34.5 kV Sub-Transmission Line Service presents the simulation emission profile for the proposed 34.5 kV sub-transmission line and associated 25-MVA sub-transmission transformer located within the proposed Little Tor Substation at 75% load. The simulation was conducted at even grade and at 1-meter in elevation.

As shown in Figure #4, the 25-MVA transformer converts the incoming 13.2 kV electrical power from the proposed Little Tor Substation 13.2 kV distribution switchgear to the 34.5 kV output voltages for the sub-transmission line. At 75%, it converts a load of 820.1 Amps to 314 Amps, which then energizes the sub-transmission line as modeled within the simulation emission profile. As shown by Figure #4, this generates a peak magnetic field of 7 mG underneath the sag point of the line at 1-meter in elevation.

Figure #4A, Proposed 34.5 kV Sub-Transmission Line Service presents the simulation emission profile for the proposed 34.5 kV sub-transmission line and associated 25-MVA sub-transmission transformer located within the proposed Little Tor Substation at 50% load. The simulation was conducted at even grade and at 1-meter in elevation.

As shown in Figure #4A, the 25-MVA transformer converts the incoming 13.2 kV electrical power from the proposed Little Tor Substation 13.2 kV distribution switchgear to the 34.5 kV output voltages for the sub-transmission line. At 50%, it converts a load of 547.8 Amps to 209 Amps, which then energizes the sub-transmission line as modeled within the simulation emission profile. As shown by Figure #4A, this generates a peak magnetic field of 4.7 mG underneath the sag point of the line at 1-meter in elevation.

Figure #4B, Proposed 34.5 kV Sub-Transmission Line Service presents the cross-section simulation emission profile for the proposed 34.5 kV sub-transmission line and associated 25-MVA sub-transmission transformer located within the proposed Little Tor Substation at 75% loads. The simulation was conducted at even grade and at the center cut of the sub-transmission line.

As shown on Figure #4B, the 1 mG threshold extends to a separation distance of roughly 23 meters away from the source.

Figure #4C, Proposed 34.5 kV Sub-Transmission Line Service presents the cross-section simulation emission profile for the proposed 34.5 kV sub-transmission line and associated 25 MVA sub-transmission transformer located within the proposed Little Tor Substation at 50% load. Figure #4C was added to represent the simulated emission profile for more average loading conditions, as opposed to the 75% (worst-case peak) emission profile presented in Figure #4B. The simulation was conducted at even grade and at the center cut of the sub-transmission line.

As shown on Figure #4C, the 1 mG threshold extends to a separation distance of roughly 20 meters away from the source.

Figure #5, Proposed 13.2 kV Underground Distribution Line Service presents the simulation emission profile for the pair of proposed underground 13.2 kV distribution lines cited to improve the reliability of the surrounding networks at 75% load. The simulation was conducted at even grade and at 1-meter in elevation.

As shown on Figure #5, the pair of 13.2 kV Underground Distribution lines were modeled at four conduits (containing three-phases) each per service. The 13.2 kV lines were programmed to the remainder current from the 13.2 kV substation switchgears within the proposed Little Tor Substation. At 75%, the remainder current after the 34.5 kV transformer drop was 1640.2 amps on MDC Bus #1 and 820.1 Amps on MDC Bus #2 for a total current of 2460 Amps. The current was divided equally for a current of 1230 amps per each 13.2 kV underground distribution line service, or, 307.5 amps per conduit, per phase. As shown by Figure #5, this generates a peak magnetic field of 21 mG above the conduit locations of the 13.2 kV distribution line at 1-meter in elevation.

Figure #5A, Proposed 13.2 kV Underground Distribution Line Service presents the cross-section simulation emission profile for the modeled underground 13.2 kV distribution lines cited to improve the reliability of the surrounding networks at 75% load. The simulation was conducted at even grade and at the center cut of the underground conduits, programmed at just over 1-meter buried elevation.

As shown by Figure #5A, the 1 mG magnetic field threshold extends roughly 10.5 meters away from the 13.2 kV distribution lines at a load of 1230 amps each.

Figure #5B, Proposed 13.2 kV Underground Distribution Line Service presents the cross-section simulation emission profile for the modeled underground 13.2 kV distribution lines cited to improve the reliability of the surrounding networks at 40% load. Figure #5B was added to represent the simulated emission profile for more average loading conditions, as opposed to the 75% (worst-case peak) emission profile presented in Figure #5A.

The simulation was conducted at even grade and at the center cut of the underground conduits, programmed at just over 1-meter buried elevation.

As shown by Figure #5B, the 1 mG magnetic field threshold extends roughly 7.5 meters away from the 13.2 kV distribution lines at a load of 656 amps each.

Figure #6, Wide-Plot Configurations, 3-D Views, presents the side-by-side comparisons of the simulation geographies presented in the sequential two diagrams, Figures #6A & #6B.

Figure #6A, Wide-Plot Existing Configuration, Full-System Emission Profile, presents the 1500-meter wide view simulation emission profile of the existing 138 kV Orange & Rockland Transmission Lines #530 & #541 before the proposed changes required for the construction and energization of the future Little Tor Substation.

As shown by the information bar on Figure #6A, the substation services were removed, reducing the draw current upon the feeder 138 kV transmission lines traversing the area. It should be noted that the adjacent models presenting the existing/future pair of Orange & Rockland transmission lines are operating at 250-MVA each (500-MVA total), or at a current of 781 amps per service at 75% load.

Figure #6B, Wide-Plot Existing Configuration, Full-System Emission Profile, presents the 1500-meter wide view simulation emission profile of both the existing 138 kV Orange & Rockland Transmission Lines #530 & #541 and the proposed changes required for the construction and energization of the future Little Tor Substation.

As shown by the information bar on Figure #6B, the simulation emission profile is operating at 75% with the 138 kV disconnects at 156.9 amps, the 13.8 kV secondary service at 1640.2 amps per transformer (3280 amps total on substation switchgear/MDC) and the 34.5 kV sub-transmission line service operating at 314 amps. It should be noted that the adjacent models presenting the existing/future pair of Orange & Rockland transmission lines are operating at 300-MVA each (600-MVA total), or at a current of 941.9 amps per service at 75% load.

Figure #6C, Wide-Plot, Proposed Configuration Only, 138kV/13.2kV/34.5kV, presents the 1500-meter wide view simulation emission profile of the future Little Tor Substation equipment Only (i.e., only the direct services related to the proposed changes including the construction of the Little Tor Substation, and the relevant 13.2 kV/34.5 kV services to the property perimeter.

As shown by the information bar on Figure #6C, the simulation emission profile is operating at 75% with the 138 kV disconnects at 156.9 amps, the 13.8 kV secondary service at 1640.2 amps per transformer (3280 amps total on substation switchgear/MDC) and the 34.5 kV sub-transmission line service operating at 314 amps. It should be noted

that the adjacent models presenting the proposed changes to the pair of Orange & Rockland transmission lines are operating at 300-MVA each (600-MVA total), or at a current of 941.9 amps per service at 75% load.

Figure #6D, Wide-Plot Existing Configuration, Full-System Emission Profile, presents the 1500-meter wide view simulation emission profile of the existing 138 kV Orange & Rockland Transmission Lines #530 & #541 before the proposed changes required for the construction and energization of the future Little Tor Substation at 40% System Load. (Note:Figures #6D and #6E were added to represent the simulated cross-section emission profiles at more average loading conditions, as opposed to the 75% (worst-case peak) emission profiles presented in Figures #6 and #6A.)

As shown by the information bar on Figure #6D, the substation services were removed, reducing the draw current upon the feeder 138 kV transmission lines traversing the area. Note that the adjacent models presenting the existing/future pair of Orange & Rockland transmission lines are operating at 250-MVA each (500-MVA total), or at a current of 416.5 amps per service at 40% load.

Figure #6E, Wide-Plot Existing Configuration, Full-System Emission Profile, presents the 1500-meter wide view simulation emission profile of both the existing 138 kV Orange & Rockland Transmission Lines #530 & #541 as well as the proposed changes required for the construction and energization of the future Little Tor Substation at 40% System Load. (Note: Figures #6D and #6E were added to represent the simulated cross-section emission profiles at more average loading conditions, as opposed to the 75% (worst-case peak) emission profiles presented in Figures #6 and #6A.)

As shown by the information bar on Figure #6E, the simulation emission profile is operating at 40% load with the 138 kV disconnects at 83.7 amps, the 13.8 kV secondary service at 874.8 amps per transformer (1549.6 amps total on substation switchgear/MDC) and the 34.5 kV sub-transmission line service operating at 167.5 amps. It should be noted that the adjacent models presenting the existing/future pair of Orange & Rockland transmission lines are operating at 300-MVA each (600-MVA total), or at a current of 500.2 amps per service at 40% load.

Fig #	Transmission Line System Load	Substation Loading	Notes
6	600 MVA Total	75% (Peak)	Figure #6 Introduction
6A	600 MVA Total	75% (Peak)	Existing Lines ONLY
6B	600 MVA Total	75% (Peak)	Full-System Emission Profile
6C	600 MVA Total	75% (Peak)	Proposed Changes ONLY

6D	600 MVA Total	40% (Typical Average)	Existing Lines ONLY
6E	600 MVA Total	40% (Typical Average)	Full-System Emission Profile

Table #3, Information chart for 1500-meter simulated emission profiles

Figures #7 and #7A, Wide-Plot Existing Configuration, North/South, presents the north to south view cross-section simulation emission profiles of the existing 138 kV Orange & Rockland Transmission Lines #530 & #541 before and after the proposed changes required for the construction and energization of the future Little Tor Substation.

It should be noted that this north/south cross-section emission profile was made at the cross-section cut through the center of the substation in order to identify the magnetic flux density levels within the areas adjacent to the proposed substation location. The table below summarizes the data on Figures #7 and #7A.

North/South Cross-Section Simulated Emission Profile Cut at 40% Load Magnetic Flux density Levels at Indicated Locations (from left to right as looking on each Figure)			
Location	Distance from Center of Substation	Magnetic Field Existing (before energization of proposed sbstation)	Magnetic Field Proposed (after energization of proposed substation)
Culver Drive	***235 meter* (775 feet)**	**0.16 mG**	**0.32 mG**
Denver Drive	***170 meter* (550 feet)**	**0.35 mG**	**0.51 mG**
Between the Southern Boundary and Denver Dr.	**550 feet to 375 feet**	**0.35 mG to 0.45 mG**	**0.51 mG to 0.88 mG**
Southern Boundary of Proposed Substation Site	***115 meter* (375 feet)**	**0.45 mG**	**0.88 mG**
Center of Proposed Substation	-	**3.5 mG**	**6 mG**
Northern Boundary of Proposed Substation Site	***120 meter* (395 feet)**	**>50 mG (Transmission Lines cross at this Coordinate)**	**>50 mG (Transmission Lines cross at this Coordinate)**
Between the Northern Boundary	**395 feet to**	**50 mG to 2.2 mG**	**50 mG to 2.7 mG**

and N. Little Tor Rd.	**1115 feet**		
North Little Tor Rd. Intersection to the Cross-Section Cut Plane	***340 meter* (1115 feet)**	**2.2 mG**	**2.7 mG**

Table #4, Information Chart for North/South Cross-Section Emission Profiles

Conclusion – Simulated Emission Profiles

The objective of the simulation emission profiles was to identify the peak simulated magnetic flux density levels from the proposed electrical equipment within the future Little Tor Substation and to identify the increase in expected magnetic flux density levels around the site. ***As the areas adjacent to the Proposed Little Tor Substation are occupied locations, VitaTech Electromagnetics strongly recommends a 10 mG long-term human health exposure threshold for the surrounding lots.***

A series of simulated emission profiles were conducted at typical worst-case loading, implemented as 75% conditions throughout most of the report (particularly for the rated systems, such as the 50-MVA / 25-MVA transformers and output sections). Additional simulated emission profiles within the final report implemented 40% loading conditions into the simulation geography in order to present a more realistic view at the predicted increase in magnetic flux density levels under typical loads present throughout the year.

As shown in the simulations above, and summarized as presented in Figures #6 through #7A, there is a measurable increase in the simulated magnetic flux density levels throughout the site. Although the predicted increase in the magnetic fields under the parameters utilized during the study was not large in magnitude, it also cannot be classified as nominal. There are two simulation emission profile comparisons which present the difference between the existing transmission lines without the proposed Little Tor Substation service and with the proposed Little Tor Substation service quite well. The first, presented as a contrast between Figures #6D and #6E, shows the increase in magnetic flux density levels (actualized by an increase from 500-MVA system total to 600-MVA system total with the substation included) as a plan-view emission profile, simulated at even grade and at 1-meter in elevation. The second, presented as a contrast between Figures #7 and #7A, shows in the increase in magnetic flux density levels as a cross-section emission profile, "cut" through the center of the proposed substation and showing the resultant increase in magnetic flux density levels in the areas located adjacent in the north/south plane.

It should be noted that each of these four emission profiles were modeled as closely to the expected system loads (500-MVA existing, 600-MVA proposed) and typical loading conditions (40% average) for the substation as possible, and that the simulated magnetic flux density levels presented on each figure are a representation of the parameters indicated in the above text for the study.

Differences in these two very important parameters would vary the simulated emission profile for the Proposed Little Tor Substation in direct relation to the increase or decrease exhibited for either system. For example, if the true system load for the pair of 138 kV transmission lines was at 2000-MVA before including the substation as opposed to the 500 MVA modeled, the "increase" in magnetic fields (despite equal loads/equipment modeled) will seem much lower in comparison. However, if the true system load for the pair of 138 kV transmission was much lower (for example, at 100-MVA), then the extra 100-MVA being added to the system will have a much more pronounced effect upon the surrounding magnetic field environment. It is important to take these factors into consideration along with the other information when coming to a final conclusion about the proposed Little Tor Substation addition.

However, the parameters utilized during the study are a valid representation of common loading conditions for the lines. At the 40% loading conditions expressed as typical for the study, the 138 kV lines are programmed at 200-MVA. The proposed Little Tor Substation (with two 50-MVA transformers) is programmed to demand another 40-MVA at 40% load for a total system load of 240-MVA for these "future" simulated emission profiles. At 200-MVA total, the magnetic fields emanating from the transmission line source decay to 10 mG and less at roughly 25 meters away from the center of the transmission line tower (20 meters away from the lines themselves). At 240-MVA total (adding in the 40-MVA of service for the proposed Little Tor Substation), this separation distance to the 10 mG and less threshold line increases from 25 meters to 29 meters.

For more information on AC ELF EMF Health Issues and the items that led to the Standards and Guidelines within the United States and abroad, please see the sections below:

AC ELF EMF Health Issues

VitaTech defines AC ELF magnetic flux density emissions according to six orders of magnitude from *low, elevated, high, very high, extremely high* to *potentially hazardous:*

First order of magnitude 1- to 9.9-mG as *low,*
Second order of magnitude 10- to 99-mG as *elevated,*
Third order of magnitude 100- to 999-mG as *high,*
Fourth order of magnitude 1000- to 9,999 mG (1 - 9.9 Gauss) as *very high,*
Fifth order 10,000- to 99,999-mG (10 - 99.9 Gauss) as *extremely high.*
Sixth order 100,000- to 999,999-mG (100 - 999.9 Gauss) as *potentially hazardous.*

Warning: at AC ELF magnetic flux density levels exceeding 50 Gauss (10 mA/m^2 induced current density threshold used by WHO, ACGHI, CENELEC, DIN/VDE, NRPG & NCRP), the human body experiences physiological and / or neurological responses because of induced currents within body tissues, organs and neurons. The actual biological effect depends on the magnitude, polarization, proximity and exposure

time to *extremely high and potentially hazardous* magnetic field sources. Finally, information about *AC ELF EMF Health Issues* and VitaTech's 10 mG (1 μT) recommended long-term human exposure limit are discussed in the next section.

AC ELF Magnetic Field Health Issues, Standards & Guidelines

Currently, there are no Federal standards for AC ELF electric and magnetic field levels. The National Energy Policy Act of 1992 authorized the Secretary of the Department of Energy (DOE) to establish a five-year, $65 million EMF Research and Public Information Dissemination (RAPID) Program to ascertain the affects of ELF EMF on human health, develop magnetic field mitigation technologies, and provide information to the public. In May 1999, the NIEHS Director Kenneth Olden, Ph.D. delivered his final report, *Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*, to Congress that stated the following in the Cover Letter and Executive Summary below:

> *The scientific evidence suggesting that ELF-EMF exposures pose any health risk is weak. The strongest evidence for health effects comes from associations observed in human populations with two forms of cancer:* ***childhood leukemia and chronic lymphocytic leukemia in occupationally exposed adults... The NIEHS concludes that ELF-EMI exposure cannot be recognized at this time as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard.***

U.S. & International Organizational AC ELF EMF Standards

The International Commission on Non-Ionizing Radiation Protection (IRPA/INIRC) have established 833 mG maximum human exposure limit over 24 hours for the general public and 4,167 mG for occupational workers. Whereas The American Conference of Governmental Industrial Hygienists (ACGIH) recommends a 10,000 mG (10 Gauss) exposure limit over 24 hours for occupational workers, but specifies 1,000 mG (1 Gauss) as a maximum exposure for workers with cardiac pacemakers.

New York State Public Service Commission AC ELF EMF Standards

Effective September 1990, the State of New York Public Service Commission (PSC) "began a process looking toward the adoption of an interim magnetic field standard for future major electric transmission facilities." The Commission concludes that a prudent approach should be taken that will avoid unnecessary increases in existing levels of magnetic field exposure. Therefore, future transmission circuits shall be designed, constructed and operated such that magnetic fields at the edges of their rights-of-way will not exceed 200 mG when the circuit phase currents are equal to the winter-normal conductor rating. They also established an electric field strength interim standard of 1.6 kV/m electric transmission facilities.

IARC June 2002 Report

In June 2002, the International Agency for Research on Cancer (IARC) issued a 400+ page report formally classifying **extremely low frequency magnetic fields as *possibly carcinogenic to humans*** based on studies of EMF and childhood leukemia. **This is the first time that a recognized public health organization has formally classified EMF as a possible cause of human cancer**. IARC found that, while selection bias in the childhood leukemia studies could not be ruled out, pooled analyses of data from a number of well-conducted studies show a fairly consistent statistical association between childhood leukemia and power-frequency residential magnetic fields above 4 milliGauss (mG), with an approximately two-fold increase in risk that is unlikely to be due to chance.

IARC is a branch of the World Health Organization. The IARC classification of EMF was made by a panel of scientists from the U.S. National Institute of Environmental Health Sciences, the U.S. Environmental Protection Agency, the U.K. National Radiological Protection Board, the California Department of Health Services, EPRI, and other institutions around the world.

Switzerland's February 2000 AC ELF Standard

The Swiss Bundersrat in February 2000 set by law an emission control limit of 10 mG from overhead and underground transmission lines, substations, transformer vaults and all electrical power sources.

VitaTech's & NCRP Draft Recommended 10 mG Standard

Section 8.4.1.3 option 3 in the National Council of Radiation Protection and Measurements (NCRP) draft report published in the July/August 1995 issue of *Microwave News* (visit the Microwave News Homepage <www.microwavenews.com> for the entire draft report) recommended the following:

> ***8.4.1.3 Option 3:*** *An exposure guideline of 1 μT (10 mG) and 100 V/m: A considerable body of observations has documented bioeffects of fields at these strengths across the gamut from isolated cells to animals, and in man. Although the majority of these reported effects do not fall directly in the category of hazards, many may be regarded as potentially hazardous. Since epidemiological studies point to increased cancer risks at even lower levels, a case can be made for recommending 1 μT (10 mG) and 100 V/m as levels not to be exceeded in prolonged human exposures. Most homes and occupational environments are within these values, but it would be prudent to assume that higher levels may constitute a health risk. In the short term, a safety guideline set at this level would have significant consequences, particularly in occupational settings and close to high voltage transmission and distribution systems, but it is unlikely to disrupt the present pattern of electricity usage. These levels may be exceeded in homes close to transmission lines, distribution lines and transformer substations, in some occupational environments, and for users of devices that operate close to the body, such as hair dryers and electric blankets. From a different perspective, adoption of such a guideline*

would serve a dual purpose: first, as a vehicle for public instruction on potential health hazards of existing systems that generate fields above these levels, as a basis for "prudent avoidance"; and second, as a point of departure in planning for acceptable field levels in future developments in housing, schooling, and the workplace, and in transportation systems, both public and private, that will be increasingly dependent on electric propulsion.

This completes the *Proposed Little Tor Substation AC ELF Simulation Emission Report and Final Conclusions.*

Regards,

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Final AC ELF Simulation Emission Report
Subject: Final AC ELF Simulation Emission Report – Orange & Rockland Proposed Little Tor Substation Project for Lines #530 & #541 in Clarkstown, New York

Dear Mr. Granirer,

VitaTech Engineering was commissioned to simulate the magnetic flux density levels emanating from the proposed Little Tor Substation to be located at the intersection of South Mountain Road and North Little Tor Road in Clarkstown, New York. The Little Tor Substation will be outfitted to the existing pair of 138 kV transmission lines (Lines #530 & #541, traveling to Spring Valley and West Haverstraw) which bisect the site, as outlined in the drawings provided by the utility company. The proposed Little Tor Substation would convert the incoming 138 kV power to 13.2 kV electrical power through a pair of 50-MVA transformers, then would step-up the converted 13.2 KV electrical power through a single 25-MVA transformer to replace the current 34.5 kV sub-transmission line source(s). As shown in the service drawings, the Little Tor Substation will be an outdoor facility to be outfitted with new buswork, switchgear equipment and switchyard cables, which were modeled within the simulation emission profiles.

The objective of the simulation emission profiles was to identify the peak simulated magnetic flux density levels from the proposed electrical equipment within the future Little Tor Substation and to identify the increase in expected magnetic flux density levels around the site. A series of simulated emission profiles were conducted at typical worst-case loading, implemented as 75% conditions throughout most of the report (particularly for the rated systems, such as the 50-MVA / 25-MVA transformers and output sections).

Electromagnetic Interference (EMI)
Electromagnetic induction occurs when time-varying AC and DC magnetic fields couple with any conductive object including wires, electronic equipment and people, thereby inducing circulating currents and voltages. The magnetic fields most people are familiar with emanate from unshielded (susceptible) electronic equipment (computers monitors, video projectors, computers, televisions, LANs, diagnostic instruments, magnetic media, etc.) and

signal cables (audio, video, telephone & data), electromagnetic induction generates electromagnetic interference (EMI), which is manifested as visible screen jitter in displays, hum in analog telephone/audio equipment, lost sync in video equipment and data errors in magnetic media or digital signal cables.

Generally, for AC ELF sources, the minimum EMI threshold is 10 milligauss (mG) in unshielded electronic equipment, especially in 14- to 17-inch color computer monitors and analog signal cables; however, the AC ELF EMI threshold for high-resolution 17- to 21-inch color monitors is only 5 mG. Actual AC ELF EMI immunity depends on the PCB and component layout, circuit design (differential verses unbalanced input amplifiers, signal-to-noise ratio, etc.), outer case composition, geometry and shielding factor (SF). ***Liquid Crystal Display (LCD's) monitors and LCD projects are not affected (susceptible) by AC ELF magnetic fields at any levels.***

However, for long-term human health exposure in occupied areas such as a residence or work desk, the recommended EMI threshold of 10 mG has been proposed by the National Council of Radiation Protection as a safe and reasonably achievable threshold for radiated time-varying AC ELF magnetic flux density levels. **As the future Little Tor Substation is an additional source of electromagnetic interference, this susceptibility standard was implemented into the formal recommendations for the site and surrounding areas.** *It is important to remember that magnetic flux density susceptibility can be specified in one on three terms: Brms, Bpeak-to-peak (p-p) and Bpeak (p). The simulation software presents each emission profile in units of milligauss, RMS (Brms). However, one can easily convert RMS to peak-peak or vice-versa using a simple formula. The typical conversion from peak-peak to RMS for AC ELF sine waves is a factor of 2.8 (divide peak-peak by 2.8 to calculate RMS).*

For example, the Brms susceptibility standard of 10 mG for long-term human health exposure can be expressed as follows:

$$Brms = 10\ \mathrm{mG} = \frac{Bp-p}{2\sqrt{2}}$$

Solving for Bpeak-to-peak:

$$Bp-p = 28.3\ \mathrm{mG}$$

Simulation Review

The simulated emission profiles include the following equipment or source(s):

- The existing 138 kV Orange & Rockland Transmission lines, specifically Lines #530 and #541, as indicated within the utility documents

- The 138 kV Primary Switchyard and Feeders to the Associated Transformers
- Two 50-MVA (50,000 kVA) Substation Transformers, 138 kV/13.2 kV

- One 25-MVA (25,000 kVA) Substation Transformer, 13.2 kV/34.5 kV

- Proposed 34.5 kV Sub-Transmission Line Service and Switchyard Conduits

- Proposed 13.2 kV Underground Distribution Lines, energized by the Substation Switchgear operating at 13.2 kV

- The simulation also implements the proposed steel pole(s) to be used at the disconnect points adjacent to the future Little Tor Substation

Figures #1 & #1A, Proposed Little Tor Substation, present the simulation emission profile for the Proposed Little Tor Substation at the standard typical worst-case loading condition of 75%. The simulation was conducted at even grade and at 1-meter in elevation (all plan-view simulations within the preliminary simulation report are conducted at 1-meter in elevation; all cross-section simulations are conducted at the cut-through indicated in the lower right-hand corner).

The Proposed Little Tor Substation as presented in Figure #1 includes only the electrical equipment models for the proposed Little Tor Substation Items (no transmission/distribution/underground lines leaving the substation included), as shown in the information pane on the right-hand side of the Figure.

At 75% Load, the 138 kV disconnects from each transmission lines are simulated at 156.9 amps to the switchyard poles at a total elevation of 16.7 meters. The lines drop into the switchyard (at a total elevation of 4.6 meters) and feed each of the 50-MVA transformers, programmed at 138 kV/13.2 kV, allowing an output current of 1640.2 amps per transformer. The double-ended tandem substation switchgear, operating at 13.2 kV, is programmed to the output current of 1640.2 amps per end, and ultimately feeds the 25MVA sub-transmission transformer (located in the lower-right-hand corner of the substation at plan-view), programmed to operate at 13.2 kV/34.5 kV. For this pair of simulations, the electrical equipment casing was modeled as a comparison between standard-clad -3 dB attenuation, which provides roughly 30% shielding (Figure #1) and heavy-clad -20 dB attenuation, which provides roughly 90% shielding (Figure #1A).

As shown by Figures #1 & #1A, simulated magnetic field emissions are roughly 1 mG in magnitude at the Hackensack River using -3 dB (and 0.5 mG and less using -20 dB), which is the bordering boundary to the adjacent areas of the proposed Little Tor Substation.

Figures #2 & #2A, Proposed Little Tor Substation, present the simulation emission profile for the Proposed Little Tor Substation at the standard average loading condition of 50%. The simulation was conducted at even grade and at 1-meter in elevation (all plan-view simulations within the preliminary simulation

report are conducted at 1-meter in elevation; all cross-section simulations are conducted at the cut-through indicated in the lower right-hand corner).
The Proposed Little Tor Substation as presented in Figure #2 includes only the electrical equipment models for the proposed Little Tor Substation Items (no transmission/distribution/underground lines leaving the substation included), as shown in the information pane on the right-hand side of the Figure.

At 50% Load, the 138 kV disconnects from each transmission lines are simulated at 104.6 amps to the switchyard poles at a total elevation of 16.7 meters. The lines drop into the switchyard (at a total elevation of 4.6 meters) and feed each of the 50-MVA transformers, programmed at 138 kV/13.2 kV, allowing an output current of 1093.4 amps per transformer. The double-ended tandem substation switchgear, operating at 13.2 kV, is programmed to the output current of 1093.4 amps per end, and ultimately feeds the 25-MVA sub-transmission transformer (located in the lower-right hand corner of the substation at plan-view), programmed to operate at 13.2 kV/34.5 kV. For this pair of simulations, the electrical equipment casing was modeled as a comparison between standard-clad -3 dB attenuation, which provides roughly 30% shielding (Figure #2) and heavy-clad -20 dB attenuation, which provides roughly 90% shielding (Figure #2A).

As shown by Figures #2 & #2A, simulated magnetic field emissions are roughly 0.6 mG in magnitude at the Hackensack River using -3 dB (and 0.4 mG and less using -20 dB), which is the bordering boundary to the adjacent areas of the proposed Little Tor Substation.

Figures #3 - #3C, Proposed 138 kV Transmission Lines #530 & #541, present the simulation emission profile for the proposed 138 kV transmission line section adjacent to the future Little Tor Substation at various loads. The simulation was conducted at even grade and at 1-meter in elevation.

As shown on Figure #3, the existing 138 kV Orange & Rockland #530 & #541 Transmission Lines were modeled to accommodate the future Little Tor Substation, including the proposed steel pole tower configuration as shown within the study. (To be specific, the tower phase elevations were modified from 22.5m, 20m, 17m to 23.3m, 20.3m, 17.3m, respectively, for the pair of proposed steel pole towers adjacent to the site).

The tables below summarize the 138 kV Transmission Line simulations by Figure:

Fig #	Transmission Line System Load	Transmission Line Current Load	Transmission Line Phasing Used
3	600 MVA Total	941 Amps per Line	Standard
3A	200 MVA Total	314 Amps per Line	Standard
3B	200 MVA Total	314 Amps per Line	Split-Reverse
3C (CS)	200 MVA Total	314 Amps per Line	Standard

Table #1, 138 kV Transmission Line Simulation Emission Profiles

Fig #	Peak Magnetic Field Under Line (at 1-meter)	Magnetic Field in Center Substation	Magnetic Field at N. Little Tor Rd.
3	84 mG	10 mG	0.5 mG
3A	27.5 mG	3 mG	0.2 mG
3B	26.5 mG	3 mG	0.2 mG
3C (CS)	27.5 mG	3 mG	0.2 mG

Table #2, 138 kV Simulated Magnetic Field Levels at 1-Meter in Elevation

Figure #4, Proposed 34.5 kV Sub-Transmission Line Service presents the simulation emission profile for the proposed 34.5 kV sub-transmission line and associated 25-MVA sub-transmission transformer located within the proposed Little Tor Substation at 75% load. The simulation was conducted at even grade and at 1-meter in elevation.

As shown in Figure #4, the 25-MVA transformer converts the incoming 13.2 kV electrical power from the proposed Little Tor Substation 13.2 kV distribution switchgear to the 34.5 kV output voltages for the sub-transmission line. At 75%, it converts a load of 820.1 Amps to 314 Amps, which then energizes the sub-transmission line as modeled within the simulation emission profile. As shown by Figure #4, this generates a peak magnetic field of 7 mG underneath the sag point of the line at 1-meter in elevation.

Figure #4A, Proposed 34.5 kV Sub-Transmission Line Service presents the simulation emission profile for the proposed 34.5 kV sub-transmission line and associated 25-MVA sub-transmission transformer located within the proposed Little Tor Substation at 50% load. The simulation was conducted at even grade and at 1-meter in elevation.

As shown in Figure #4A, the 25-MVA transformer converts the incoming 13.2 kV electrical power from the proposed Little Tor Substation 13.2 kV distribution switchgear to the 34.5 kV output voltages for the sub-transmission line. At 50%, it converts a load of 547.8 Amps to 209 Amps, which then energizes the sub-transmission line as modeled within the simulation emission profile. As shown by Figure #4A, this generates a peak magnetic field of 4.7 mG underneath the sag point of the line at 1-meter in elevation.

Figure #4B, Proposed 34.5 kV Sub-Transmission Line Service presents the cross-section simulation emission profile for the proposed 34.5 kV sub-transmission line and associated 25-MVA sub-transmission transformer located within the proposed Little Tor Substation at 75% loads. The simulation was conducted at even grade and at the center cut of the sub-transmission line.

As shown on Figure #4B, the 1 mG threshold extends to a separation distance of roughly 23 meters away from the source.

Figure #4C, Proposed 34.5 kV Sub-Transmission Line Service presents the cross-section simulation emission profile for the proposed 34.5 kV sub-transmission line and associated 25 MVA sub-transmission transformer located within the proposed Little Tor Substation at 50% load. Figure #4C was added to represent the simulated emission profile for more average loading conditions, as opposed to the 75% (worst-case peak) emission profile presented in Figure #4B. The simulation was conducted at even grade and at the center cut of the sub-transmission line.

As shown on Figure #4C, the 1 mG threshold extends to a separation distance of roughly 20 meters away from the source.

Figure #5, Proposed 13.2 kV Underground Distribution Line Service presents the simulation emission profile for the pair of proposed underground 13.2 kV distribution lines cited to improve the reliability of the surrounding networks at 75% load. The simulation was conducted at even grade and at 1-meter in elevation.

As shown on Figure #5, the pair of 13.2 kV Underground Distribution lines were modeled at four conduits (containing three-phases) each per service. The 13.2 kV lines were programmed to the remainder current from the 13.2 kV substation switchgears within the proposed Little Tor Substation. At 75%, the remainder current after the 34.5 kV transformer drop was 1640.2 amps on MDC Bus #1 and 820.1 Amps on MDC Bus #2 for a total current of 2460 Amps. The current was divided equally for a current of 1230 amps per each 13.2 kV underground distribution line service, or, 307.5 amps per conduit, per phase. As shown by Figure #5, this generates a peak magnetic field of 21 mG above the conduit locations of the 13.2 kV distribution line at 1-meter in elevation.

Figure #5A, Proposed 13.2 kV Underground Distribution Line Service presents the cross-section simulation emission profile for the modeled underground 13.2 kV distribution lines cited to improve the reliability of the surrounding networks at 75% load. The simulation was conducted at even grade and at the center cut of the underground conduits, programmed at just over 1-meter buried elevation.

As shown by Figure #5A, the 1 mG magnetic field threshold extends roughly 10.5 meters away from the 13.2 kV distribution lines at a load of 1230 amps each.

Figure #5B, Proposed 13.2 kV Underground Distribution Line Service presents the cross-section simulation emission profile for the modeled underground 13.2 kV distribution lines cited to improve the reliability of the surrounding networks at 40% load. Figure #5B was added to represent the simulated emission profile for more average loading conditions, as opposed to the 75% (worst-case peak) emission profile presented in Figure #5A.

The simulation was conducted at even grade and at the center cut of the underground conduits, programmed at just over 1-meter buried elevation.

As shown by Figure #5B, the 1 mG magnetic field threshold extends roughly 7.5 meters away from the 13.2 kV distribution lines at a load of 656 amps each.

Figure #6, Wide-Plot Configurations, 3-D Views, presents the side-by-side comparisons of the simulation geographies presented in the sequential two diagrams, Figures #6A & #6B.

Figure #6A, Wide-Plot Existing Configuration, Full-System Emission Profile, presents the 1500-meter wide view simulation emission profile of the existing 138 kV Orange & Rockland Transmission Lines #530 & #541 before the proposed changes required for the construction and energization of the future Little Tor Substation.

As shown by the information bar on Figure #6A, the substation services were removed, reducing the draw current upon the feeder 138 kV transmission lines traversing the area. It should be noted that the adjacent models presenting the existing/future pair of Orange & Rockland transmission lines are operating at 250-MVA each (500-MVA total), or at a current of 781 amps per service at 75% load.

Figure #6B, Wide-Plot Existing Configuration, Full-System Emission Profile, presents the 1500-meter wide view simulation emission profile of both the existing 138 kV Orange & Rockland Transmission Lines #530 & #541 and the proposed changes required for the construction and energization of the future Little Tor Substation.

As shown by the information bar on Figure #6B, the simulation emission profile is operating at 75% with the 138 kV disconnects at 156.9 amps, the 13.8 kV secondary service at 1640.2 amps per transformer (3280 amps total on substation switchgear/MDC) and the 34.5 kV sub-transmission line service operating at 314 amps. It should be noted that the adjacent models presenting the existing/future pair of Orange & Rockland transmission lines are operating at 300-MVA each (600-MVA total), or at a current of 941.9 amps per service at 75% load.

Figure #6C, Wide-Plot, Proposed Configuration Only, 138kV/13.2kV/34.5kV, presents the 1500-meter wide view simulation emission profile of the future Little Tor Substation equipment Only (i.e., only the direct services related to the proposed changes including the construction of the Little Tor Substation, and the relevant 13.2 kV/34.5 kV services to the property perimeter.

As shown by the information bar on Figure #6C, the simulation emission profile is operating at 75% with the 138 kV disconnects at 156.9 amps, the 13.8 kV secondary service at 1640.2 amps per transformer (3280 amps total on substation switchgear/MDC) and the 34.5 kV sub-transmission line service operating at 314 amps. It should be noted

that the adjacent models presenting the proposed changes to the pair of Orange & Rockland transmission lines are operating at 300-MVA each (600-MVA total), or at a current of 941.9 amps per service at 75% load.

Figure #6D, Wide-Plot Existing Configuration, Full-System Emission Profile, presents the 1500-meter wide view simulation emission profile of the existing 138 kV Orange & Rockland Transmission Lines #530 & #541 before the proposed changes required for the construction and energization of the future Little Tor Substation at 40% System Load. (Note:Figures #6D and #6E were added to represent the simulated cross-section emission profiles at more average loading conditions, as opposed to the 75% (worst-case peak) emission profiles presented in Figures #6 and #6A.)

As shown by the information bar on Figure #6D, the substation services were removed, reducing the draw current upon the feeder 138 kV transmission lines traversing the area. Note that the adjacent models presenting the existing/future pair of Orange & Rockland transmission lines are operating at 250-MVA each (500-MVA total), or at a current of 416.5 amps per service at 40% load.

Figure #6E, Wide-Plot Existing Configuration, Full-System Emission Profile, presents the 1500-meter wide view simulation emission profile of both the existing 138 kV Orange & Rockland Transmission Lines #530 & #541 as well as the proposed changes required for the construction and energization of the future Little Tor Substation at 40% System Load. (Note: Figures #6D and #6E were added to represent the simulated cross-section emission profiles at more average loading conditions, as opposed to the 75% (worst-case peak) emission profiles presented in Figures #6 and #6A.)

As shown by the information bar on Figure #6E, the simulation emission profile is operating at 40% load with the 138 kV disconnects at 83.7 amps, the 13.8 kV secondary service at 874.8 amps per transformer (1549.6 amps total on substation switchgear/MDC) and the 34.5 kV sub-transmission line service operating at 167.5 amps. It should be noted that the adjacent models presenting the existing/future pair of Orange & Rockland transmission lines are operating at 300-MVA each (600-MVA total), or at a current of 500.2 amps per service at 40% load.

Fig #	Transmission Line System Load	Substation Loading	Notes
6	600 MVA Total	75% (Peak)	Figure #6 Introduction
6A	600 MVA Total	75% (Peak)	Existing Lines ONLY
6B	600 MVA Total	75% (Peak)	Full-System Emission Profile
6C	600 MVA Total	75% (Peak)	Proposed Changes ONLY

6D	600 MVA Total	40% (Typical Average)	Existing Lines ONLY
6E	600 MVA Total	40% (Typical Average)	Full-System Emission Profile

Table #3, Information chart for 1500-meter simulated emission profiles

Figures #7 and #7A, Wide-Plot Existing Configuration, North/South, presents the north to south view cross-section simulation emission profiles of the existing 138 kV Orange & Rockland Transmission Lines #530 & #541 before and after the proposed changes required for the construction and energization of the future Little Tor Substation.

It should be noted that this north/south cross-section emission profile was made at the cross-section cut through the center of the substation in order to identify the magnetic flux density levels within the areas adjacent to the proposed substation location. The table below summarizes the data on Figures #7 and #7A.

North/South Cross-Section Simulated Emission Profile Cut at 40% Load Magnetic Flux density Levels at Indicated Locations (from left to right as looking on each Figure)			
Location	Distance from Center of Substation	Magnetic Field Existing (before energization of proposed sbstation)	Magnetic Field Proposed (after energization of proposed substation)
Culver Drive	***235 meter* (775 feet)**	**0.16 mG**	**0.32 mG**
Denver Drive	***170 meter* (550 feet)**	**0.35 mG**	**0.51 mG**
Between the Southern Boundary and Denver Dr.	**550 feet to 375 feet**	**0.35 mG to 0.45 mG**	**0.51 mG to 0.88 mG**
Southern Boundary of Proposed Substation Site	***115 meter* (375 feet)**	**0.45 mG**	**0.88 mG**
Center of Proposed Substation	-	**3.5 mG**	**6 mG**
Northern Boundary of Proposed Substation Site	***120 meter* (395 feet)**	**>50 mG (Transmission Lines cross at this Coordinate)**	**>50 mG (Transmission Lines cross at this Coordinate)**
Between the Northern Boundary	**395 feet to**	**50 mG to 2.2 mG**	**50 mG to 2.7 mG**

and N. Little Tor Rd.	**1115 feet**		
North Little Tor Rd. Intersection to the Cross-Section Cut Plane	***340 meter* (1115 feet)**	**2.2 mG**	**2.7 mG**

Table #4, Information Chart for North/South Cross-Section Emission Profiles

Conclusion – Simulated Emission Profiles

The objective of the simulation emission profiles was to identify the peak simulated magnetic flux density levels from the proposed electrical equipment within the future Little Tor Substation and to identify the increase in expected magnetic flux density levels around the site. ***As the areas adjacent to the Proposed Little Tor Substation are occupied locations, VitaTech Electromagnetics strongly recommends a 10 mG long-term human health exposure threshold for the surrounding lots.***

A series of simulated emission profiles were conducted at typical worst-case loading, implemented as 75% conditions throughout most of the report (particularly for the rated systems, such as the 50-MVA / 25-MVA transformers and output sections). Additional simulated emission profiles within the final report implemented 40% loading conditions into the simulation geography in order to present a more realistic view at the predicted increase in magnetic flux density levels under typical loads present throughout the year.

As shown in the simulations above, and summarized as presented in Figures #6 through #7A, there is a measurable increase in the simulated magnetic flux density levels throughout the site. Although the predicted increase in the magnetic fields under the parameters utilized during the study was not large in magnitude, it also cannot be classified as nominal. There are two simulation emission profile comparisons which present the difference between the existing transmission lines without the proposed Little Tor Substation service and with the proposed Little Tor Substation service quite well. The first, presented as a contrast between Figures #6D and #6E, shows the increase in magnetic flux density levels (actualized by an increase from 500-MVA system total to 600-MVA system total with the substation included) as a plan-view emission profile, simulated at even grade and at 1-meter in elevation. The second, presented as a contrast between Figures #7 and #7A, shows in the increase in magnetic flux density levels as a cross-section emission profile, "cut" through the center of the proposed substation and showing the resultant increase in magnetic flux density levels in the areas located adjacent in the north/south plane.

It should be noted that each of these four emission profiles were modeled as closely to the expected system loads (500-MVA existing, 600-MVA proposed) and typical loading conditions (40% average) for the substation as possible, and that the simulated magnetic flux density levels presented on each figure are a representation of the parameters indicated in the above text for the study.

Differences in these two very important parameters would vary the simulated emission profile for the Proposed Little Tor Substation in direct relation to the increase or decrease exhibited for either system. For example, if the true system load for the pair of 138 kV transmission lines was at 2000-MVA before including the substation as opposed to the 500 MVA modeled, the "increase" in magnetic fields (despite equal loads/equipment modeled) will seem much lower in comparison. However, if the true system load for the pair of 138 kV transmission was much lower (for example, at 100-MVA), then the extra 100-MVA being added to the system will have a much more pronounced effect upon the surrounding magnetic field environment. It is important to take these factors into consideration along with the other information when coming to a final conclusion about the proposed Little Tor Substation addition.

However, the parameters utilized during the study are a valid representation of common loading conditions for the lines. At the 40% loading conditions expressed as typical for the study, the 138 kV lines are programmed at 200-MVA. The proposed Little Tor Substation (with two 50-MVA transformers) is programmed to demand another 40-MVA at 40% load for a total system load of 240-MVA for these "future" simulated emission profiles. At 200-MVA total, the magnetic fields emanating from the transmission line source decay to 10 mG and less at roughly 25 meters away from the center of the transmission line tower (20 meters away from the lines themselves). At 240-MVA total (adding in the 40-MVA of service for the proposed Little Tor Substation), this separation distance to the 10 mG and less threshold line increases from 25 meters to 29 meters.

For more information on AC ELF EMF Health Issues and the items that led to the Standards and Guidelines within the United States and abroad, please see the sections below:

AC ELF EMF Health Issues

VitaTech defines AC ELF magnetic flux density emissions according to six orders of magnitude from *low, elevated, high, very high, extremely high* to *potentially hazardous:*

First order of magnitude 1- to 9.9-mG as *low,*
Second order of magnitude 10- to 99-mG as *elevated,*
Third order of magnitude 100- to 999-mG as *high,*
Fourth order of magnitude 1000- to 9,999 mG (1 - 9.9 Gauss) as *very high,*
Fifth order 10,000- to 99,999-mG (10 - 99.9 Gauss) as *extremely high.*
Sixth order 100,000- to 999,999-mG (100 - 999.9 Gauss) as *potentially hazardous.*

Warning: at AC ELF magnetic flux density levels exceeding 50 Gauss (10 mA/m^2 induced current density threshold used by WHO, ACGHI, CENELEC, DIN/VDE, NRPG & NCRP), the human body experiences physiological and / or neurological responses because of induced currents within body tissues, organs and neurons. The actual biological effect depends on the magnitude, polarization, proximity and exposure

time to *extremely high and potentially hazardous* magnetic field sources. Finally, information about *AC ELF EMF Health Issues* and VitaTech's 10 mG (1 μT) recommended long-term human exposure limit are discussed in the next section.

AC ELF Magnetic Field Health Issues, Standards & Guidelines

Currently, there are no Federal standards for AC ELF electric and magnetic field levels. The National Energy Policy Act of 1992 authorized the Secretary of the Department of Energy (DOE) to establish a five-year, $65 million EMF Research and Public Information Dissemination (RAPID) Program to ascertain the affects of ELF EMF on human health, develop magnetic field mitigation technologies, and provide information to the public. In May 1999, the NIEHS Director Kenneth Olden, Ph.D. delivered his final report, *Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*, to Congress that stated the following in the Cover Letter and Executive Summary below:

> *The scientific evidence suggesting that ELF-EMF exposures pose any health risk is weak. The strongest evidence for health effects comes from associations observed in human populations with two forms of cancer:* ***childhood leukemia and chronic lymphocytic leukemia in occupationally exposed adults... The NIEHS concludes that ELF-EMI exposure cannot be recognized at this time as entirely safe because of weak scientific evidence that exposure may pose a leukemia hazard.***

U.S. & International Organizational AC ELF EMF Standards

The International Commission on Non-Ionizing Radiation Protection (IRPA/INIRC) have established 833 mG maximum human exposure limit over 24 hours for the general public and 4,167 mG for occupational workers. Whereas The American Conference of Governmental Industrial Hygienists (ACGIH) recommends a 10,000 mG (10 Gauss) exposure limit over 24 hours for occupational workers, but specifies 1,000 mG (1 Gauss) as a maximum exposure for workers with cardiac pacemakers.

New York State Public Service Commission AC ELF EMF Standards

Effective September 1990, the State of New York Public Service Commission (PSC) "began a process looking toward the adoption of an interim magnetic field standard for future major electric transmission facilities." The Commission concludes that a prudent approach should be taken that will avoid unnecessary increases in existing levels of magnetic field exposure. Therefore, future transmission circuits shall be designed, constructed and operated such that magnetic fields at the edges of their rights-of-way will not exceed 200 mG when the circuit phase currents are equal to the winter-normal conductor rating. They also established an electric field strength interim standard of 1.6 kV/m electric transmission facilities.

IARC June 2002 Report

In June 2002, the International Agency for Research on Cancer (IARC) issued a 400+ page report formally classifying **extremely low frequency magnetic fields as *possibly carcinogenic to humans*** based on studies of EMF and childhood leukemia. **This is the first time that a recognized public health organization has formally classified EMF as a possible cause of human cancer.** IARC found that, while selection bias in the childhood leukemia studies could not be ruled out, pooled analyses of data from a number of well-conducted studies show a fairly consistent statistical association between childhood leukemia and power-frequency residential magnetic fields above 4 milliGauss (mG), with an approximately two-fold increase in risk that is unlikely to be due to chance.

IARC is a branch of the World Health Organization. The IARC classification of EMF was made by a panel of scientists from the U.S. National Institute of Environmental Health Sciences, the U.S. Environmental Protection Agency, the U.K. National Radiological Protection Board, the California Department of Health Services, EPRI, and other institutions around the world.

Switzerland's February 2000 AC ELF Standard

The Swiss Bundersrat in February 2000 set by law an emission control limit of 10 mG from overhead and underground transmission lines, substations, transformer vaults and all electrical power sources.

VitaTech's & NCRP Draft Recommended 10 mG Standard

Section 8.4.1.3 option 3 in the National Council of Radiation Protection and Measurements (NCRP) draft report published in the July/August 1995 issue of *Microwave News* (visit the Microwave News Homepage <www.microwavenews.com> for the entire draft report) recommended the following:

> ***8.4.1.3 Option 3:*** *An exposure guideline of 1 μT (10 mG) and 100 V/m: A considerable body of observations has documented bioeffects of fields at these strengths across the gamut from isolated cells to animals, and in man. Although the majority of these reported effects do not fall directly in the category of hazards, many may be regarded as potentially hazardous. Since epidemiological studies point to increased cancer risks at even lower levels, a case can be made for recommending 1 μT (10 mG) and 100 V/m as levels not to be exceeded in prolonged human exposures. Most homes and occupational environments are within these values, but it would be prudent to assume that higher levels may constitute a health risk. In the short term, a safety guideline set at this level would have significant consequences, particularly in occupational settings and close to high voltage transmission and distribution systems, but it is unlikely to disrupt the present pattern of electricity usage. These levels may be exceeded in homes close to transmission lines, distribution lines and transformer substations, in some occupational environments, and for users of devices that operate close to the body, such as hair dryers and electric blankets. From a different perspective, adoption of such a guideline*

would serve a dual purpose: first, as a vehicle for public instruction on potential health hazards of existing systems that generate fields above these levels, as a basis for "prudent avoidance"; and second, as a point of departure in planning for acceptable field levels in future developments in housing, schooling, and the workplace, and in transportation systems, both public and private, that will be increasingly dependent on electric propulsion.

This completes the *Proposed Little Tor Substation AC ELF Simulation Emission Report and Final Conclusions.*

Regards,

Greg Slonka – EMF Technician/Simulation Programmer
VitaTech Engineering (540) 286-1984

Debbie Tretola

From: Jose Simoes [j.simoes@clarkstown.org]
Sent: Friday, June 08, 2012 4:07 PM
To: Anthony Montalbano
Subject: Fwd: Information on PCB emissions from Substation Fires

---------- Forwarded message ----------
From: **Walker, Kirsten** <kwalker@enduranceservices.com>
Date: Fri, Jun 8, 2012 at 1:58 PM
Subject: Information on PCB emissions from Substation Fires
To: "s.thormann@clarkstown.org" <s.thormann@clarkstown.org>, "j.simoes@clarkstown.org" <j.simoes@clarkstown.org>
Cc: Bob Geneslaw <rgeneslaw@aol.com>, Jose Simoes <j.simoes@clarkstown.org>, Shirley Lasker <shirlasker@aol.com>, Amy Mele <a_mele@town.clarkstown.ny.us>, Martus Granirer <martus@granirer.us>, Terri Thal <thal.terri@gmail.com>, "Walker, Kirsten" <kwalker@enduranceservices.com>, Mark Gilliland <mg@markg.org>, "artgirl22@earthlink.net" <artgirl22@earthlink.net>, Patricia Podolak <vze27vte@verizon.net>, "annejaffeholmes@me.com" <annejaffeholmes@me.com>, Susan Porcino <sporcino@hotmail.com>, Walter Rodriguez <wrodriguez@tasrc.com>, "JHOL49@aol.com" <JHOL49@aol.com>, Rosalie Cautillo <r.cautillo@clarkstown.org>, Peter Vitro <pobrod46@aol.com>, Bob McGloughlin <litmc2@aol.com>, "marvin@baumimagegroup.com" <marvin@baumimagegroup.com>

Dear Ms. Thormann, and Mr. Simoes,

I am attaching an article about the fire at the Dumbo substation in NYC. What we did not mention in the last meeting was the effects of the actual fire. This point has gone largely unquestioned. We have studied the effect of the potential for leaks with the substation and the containment of those substances. This article speaks to the fire releasing PCBs – a known carcinogen into the AIR, that even three days after the fire, were still at unacceptable levels. Con Ed was slow to release the report, and slow or negligent about any resulting property damage. As a home owner, I need to know what effect the release of massive amounts of PCBs would do to my home, my child, and to my real estate value. Additionally, I want to know what Con Ed would do to address an airborne contaminant. My assumption based on this article – is that they would not do much. Considering that most of these concerns are alleviated by putting systems underground, including the surrounding lines, I am not sure why this is not the protocol given the potential environmental hazards. It certainly is the protocol in other countries.

http://dumbonyc.com/2012/05/14/coned-substation-explosion-collateral-damage/

I am also sending along information on PCBs to put this in perspective.

http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/about.htm

I had the great misfortune of living in downtown Manhattan during 9/11. The air was heavy with toxic smoke well after the fires had subsided. I have friends who worked in the relief efforts, and are paying the price now with their health. Being in the aftermath of a toxic hazardous fire, is not a situation I want to repeat.

I realize that this concern is over a "what if" scenario, but the problem is that these fires are quite common. They have been caused by lightning strikes, snakes in the area (which are abundant), and other animal interference. Since I moved to South Mountain Road, I have personally witnessed 4 lightning strikes on my property, and have had 6 stricken trees removed. My point here is that excessive lightning is not a rare event in this wooded area. The method of reducing interference through an electrified fence is also problematic. I have a 2 year old rambunctious boy. If he makes it across the street and touches an electrified fence, what will Con Ed do for me? Surely they don't expect that a child his age would be able to read or comprehend the warning sign. Two weekends ago, he wandered out of the house and after 10 minutes of frantically searching for him, I found him by the little bridge in my front yard. He woke up from a nap, and went looking for me. At a minimum, it is up to Con Ed to provide a suitable barrier for my property as well.

Many experts spoke about the safety of background EMF. I don't disagree that background EMF is less dangerous, but they spoke to the permanent location of the substation. They spoke to when the substation would be firmly planted in the middle of the property. For now, it is not in the middle of the 10 acre lot. It is right on South Mountain Road – and is analogous to standing us in front of a microwave for 24 hours a day. The experts questioned only examined the proposed scenario, not the immediate scenario. Even background EMF, has an effect. The article I mentioned before studied the effect of EMF in African American Women and what they used as the low grade source was an electrical blanket.

There are also a number of articles which turn my conjecture about the effects of EMF on autism, into fact. It isn't just harmful in its role as a contributing factor of autism, it also slows any improvement and development.

http://www.earthcalm.com/5431/emfs-and-health/emf-radiation-cause-of-autism/

While we are not debating the significant demolition of the trees in the right of way that Con Ed is undertaking simultaneously on my property, I do feel that it's particularly unjust to have one house as the apex of all of this destruction. Yes, it's one house, but it's MY house. The trees in the right of way offer a barrier to the EMF caused by the power lines, and the erosion and excessive storms have wiped out the barrier of trees on the south end of the property facing the substation. In essence, my house has become a radioactive disaster. At a minimum, it should be up to Con Ed to measure the levels of EMF on everyone's perimeter boarders, and rectify any overages in acceptable levels of EMF.

I also want to mention that I did hear back from the assessment board who decided that the value of my house was decreased 10% (Though I believe that it's more like a 40% decrease). I don't know what tax adjustment is made because of that, but I believe that it should be significant. I believe that the value of my house is at about half of the purchase price. That means that I can't refinance my mortgage, and take advantage of lower mortgage rates. Which, as someone with very good credit, costs me about $650 per month. The value of my house is lower than the mortgage that is left on it. That's not because of the economy, that's because of Con Ed. Why aren't I being compensated for that? In fact why isn't everyone on South Mountain Road being compensated? If that is the demand, from all of the residents on South Mountain Road, doesn't it become more economically advantageous for Con Ed to bury the lines, and the substation?

I do expect that this will be a matter of public record, and I thank you for your time.

Best Regards,

Kirsten Walker

This email and any files transmitted with it are confidential and intended solely for the use of the individual or entity to whom they are addressed. If you have received this email in error please notify the system manager. This message contains confidential information and is intended only for the individual named. If you are not the named addressee you should not disseminate, distribute or copy this e-mail.

~!~

file
O&R

April 2, 2012

Town of Clarkstown
Planning Office
10 Maple Avenue
New City, NY 10956

Dear Mr. Jose Simoes,

I am writing to voice complaint regarding a recent situation with Orange and Rockland Utilities. I am the owner at 211 South Mountain Road, located directly across the street from the new substation being built by Orange and Rockland. Understandably, I am distressed at the complete **DEVASTATION** of my property value, which will result from the building of the sub station. To add insult to injury, I am told that all of the trees on the east side of **MY** property have to be chopped down because of the Right of Way jurisdiction, due to the danger that these trees will interrupt the power lines. When I purchased the house in 2009, I was told that the trees on the property would be allowed to stand. I called Orange and Rockland to discuss issues and trepidation I had regarding the house's proximity to cancer causing power lines. I was assured that there was no danger of this. Notwithstanding, I am now being told that the trees on the property must go and that they are not at any obligation to replace anything. They are allowed to leave me with a lawn full of stumps, and there is no money for any landscaping so all of the funds for this will have to come out of my own pocket. I find this to be **outrageous.** Any eminent domain law will specifically protect me from this kind of bullying, and in fact Orange and Rockland, **IS** liable for replacing the trees and landscaping damaged at their expense. If they are not, then this has further decreased the value of my property. In addition to wanting an advocate in this regard, I believe that my taxes should be re-assessed by the county in order to consider the fact that the town's permits have now made my house unsellable.

I think of myself as the steward of the former house of Ernie Kovacs and Edie Adams. I feel that it's completely inappropriate to bully citizens into thinking that they don't have any rights in the face of eminent domain laws. In fact I do have rights. I also have a voice, and I intend to use whichever means necessary to expose the kind of bullying that is going on here. This house should be considered a treasure to Rockland County, to New City, and to South Mountain Road. Instead, with the Planning Committee's help you have made it a mockery. In your meetings with the "higher ups" of Orange and Rockland, are you ever made aware that you have destroyed my life? You have helped to destroy the value of my property, and I intend to find a way to expose that. Orange and Rockland, could have given me a plan for landscaping of the property, and a proposal for the work being done. Instead, I was told that they were bulldozing the area in front of the lines, and removing the east facing trees. I was told that I had no choice because they were allowed to do this, and I had no say in the matter. I am told that the trees can't

be pruned back, as they were in previous years. This is a significant issue since the trees provide a barrier between my neighbor and their 100 cats, and my property.

I would like to see the survey plans for my property with the demarcation lines clearly drawn for the "Right of Way". I would also like to see any laws pertaining to the "Right of Way". I am formally requesting that be sent from your office to my home. I would also like to speak with someone from your office, since you feel that you can capriciously destroy my life savings, to understand how you can be allowed to give away every right to my property, with no recourse for me to protect myself. Who should be my advocate against a behemoth like Orange and Rockland? Who should be my voice, if not the people to whom I pay over $13,000 in taxes to per annum? Alternatively, since they are telling me that they have to access my property then they will have to buy it. I will no longer cooperate with this process, and if that means that I build an electrified fence, on my property, I believe that I would be within my rights. I will be contacting a lawyer, but given they have notified me that the demolition of my property will begin in less than two weeks, I am not sure what kind of time I have.

I am expecting your call to discuss. I am available between 1:30pm – and 4:00-pm this afternoon at 914-539-4555, or at 646-457-2717.

Regards,

Kirsten Walker

cc: Shirley Thorman
Nita Lowey
Eliot Engel
Chuck Schumer
Kirsten Gillibrand

June 22, 2012

Shirley J. Thormann - Chairperson, Town of Clarkstown Planning Board
Rudolph J. Yacyshyn - Vice Chairman, Town of Clarkstown Planning Board
Plannning Board Members
Gilbert J. Heim, Jr.
Peter E. Streitman
Thomas A. Trevor
Mary Jane E. O'Connar
Mara S. Blumenthal

cc
Alex Gromack, Town Supervisor,
Jose Simoes, Town Planner,
Amy Mele, Town Attorney,
Bob Geneslaw, Planning Consultant,
Shirley Lasker, Town Councilperson concerned with environment
Martus Granirer, West Branch Conservation Association, ,
Terri Thal, West Branch Conservation Association,
Marvin Baum

Dear Ms Thormann,

Please give copies of this letter to all other members of the Town of Clarkstown Planning Board.

I am contacting you to express my concerns regarding the O&R proposed Little Tor substation. I live at 151 South Mountain Road in New City. I have a doctorate degree in Earth and Environmental Sciences, and I feel responsible to share my professional opinion with the community.

I ask the Planning Board to commission a Health Risk Assessment, which will study all risk factors of the proposed substation (not just EMFs) in a holistic approach. Risk Assessment is the current scientific tool to present estimates of risk. In its Draft Environmental Impact Study, O&R claims that there is no need for an inclusion of Health Risk Assessment. One may argue that the amount of EMFs is below the threshold, therefore there will be no risk. While the argument might be accurate for a single factor, the reality is very different when you add up all health risk factors (e.g. high voltage, oil, water contamination, etc.).

O&R's plan will expose the public to some amount of each of these risk factors. Each of these factors is well known for having direct correlation with many types of cancers, health issues, disabilities, etc. Public health researchers/scientists can determine the weight factor for each one, and then, by using statistical and spatial analysis and methodologies they will be able to calculate the overall risk factor.

It is extremely important that the Planning Board not only commissions a Health Risk Assessment, but also that its scope (again, all elements such as EMF, high voltage, oil, etc as well as the methodologies) is clearly described. I cannot stress this matter enough.

I have used these statistical analyses in my field of research. The Health Risk Assessment must be conducted by a public health scientist.

Please include this statement in the public comments about the Little Tor Substation DEIS. Please include a requirement for this study in the Supplemental DEIS.

Thank you for your hard work.

Marzie Jafari, Ph.D.
Professor and Dean
Lehman College, The City University of New York
marzie2006@gmail.com

Town of Clarkstown

Diane Papenmeyer <d.papenmeyer@clarkstown.org>

Fw: Lake Lucille Utility Poles

1 message

j.simoes@clarkstown.org <j.simoes@clarkstown.org> Fri, Jun 22, 2012 at 5:15 PM
Reply-To: j.simoes@clarkstown.org
To: Diane Papenmeyer <d.papenmeyer@clarkstown.org>

Print and file..... You know the routine
Sent from my Verizon Wireless BlackBerry

From: William Terribile <wterribile@yahoo.com>
Date: Fri, 22 Jun 2012 14:07:49 -0700 (PDT)
To: m.connar@clarkstown.org<m.connar@clarkstown.org>;
t.trevor@clarkstown.org<t.trevor@clarkstown.org>;
p.streitman@clarkstown.org<p.streitman@clarkstown.org>;
g.heim@clarkstown.org<g.heim@clarkstown.org>; j.simoes@clarkstown.org<j.simoes@clarkstown.org>;
s.thormann@clarkstown.org<s.thormann@clarkstown.org>;
r.yacyshyn@clarkstown.org<r.yacyshyn@clarkstown.org>;
m.blumenthal@clarkstown.org<m.blumenthal@clarkstown.org>
ReplyTo: William Terribile <wterribile@yahoo.com>
Subject: Lake Lucille Utility Poles

Dear Board Members,
Just to update everyone, I got a call from Kim Campbell who works for O&R the morning after the last planning board meeting. She asked me if it would be alright if O&R goes out and assess the problem poles on Thursday or Friday and than meet with me on Monday June 18th to discuss how they would fix the pole.
Needless to say after emails and promises I am still waiting to hear from them. I email Kim and she says she will get back to me but never does that happen.If they can't stick to what they say to the planing board, why are we going to aloud a substation near a stream that people drink the water.

Bill Terribile
President of Lake Lucille

~!~

Town of Clarkstown

Jose Simoes <j.simoes@clarkstown.org>

South Mountain Substation Plan

1 message

William Michie <w.michie@att.net> Sat, Jun 23, 2012 at 10:53 PM
To: s.thormann@clarkstown.org, a.gromack@clarkstown.or, j.simoes@clarkstown.org, a.mele@clarkstown.org, rgeneslaw@aol.com, 9-1@newcityfire.org

Dear Ms. Thormann and all members of the Planning Board:
I understand you are considering giving a permit to have an electrical substation built in New City that is over a gas line and a stream that feeds into a local reservoir. The only sane response is, this is crazy.
We just saw a gas line explode in Nyack. It is neither uncommon nor unlikely. Why would you want to locate a substation near one? Such an action could only exacerbate the dangers inherent in gaslines, and the danger of water contamination makes this scenario even more unthinkable.
Please reject the application and at least try to find a better location.
Thank you,
Bill Michie
80 Sawmill Road, New City