

Mount Laurel MUA Solar Energy

Another Step Towards A Sustainable Future



Ramblewood Solar Electric Generating Facility

Dedication Ceremony

September 16, 2010

Other Acknowledgements

Rick Dovey and Katie Vesey of the Atlantic County Utilities Authority for their guidance

Dr. Jess Everett and Ulrich Schwabe from Rowan University for assistance with the feasibility analysis and conceptual design

Our neighbors at 202 thru 218 Ramblewood Parkway for their cooperation during planning and construction

Lighton Industries, Inc for providing financial assistance associated with today's dedication

Authority Members and Staff

Chairman	Carl V. Buck, III
Vice-Chairman	Irwin Edelson
Secretary	Frederick Braun
Member	Elwood Knight
Member	James Misselwitz
Executive Director	Pamela J. Carolan
Operations Engineer	Robert Adler
Project Manager	Charles Shoemaker

Our Mission Statement

Provide safe, dependable and affordable water and wastewater services to our customers in an environmentally conscious manner while committed to our community's needs.

Ramblewood Site History

The history of the Mount Laurel Township MUA began at this site in 1970. That was the year the MUA purchased the Ramblewood Water Treatment Plant and Ramblewood Sewage Treatment Plant at "Penny Bridge" from the developer of Ramblewood for \$2.5 million. At that time Penny Bridge was the name of this area.

In 1988, the Ramblewood Pumping Station was constructed and all wastewater from the Ramblewood development and other adjacent areas was pumped to the Authority's wastewater treatment facility off of Hartford Road which was upgraded in 1997 for \$19 million. Since the treatment plant at the Ramblewood site was no longer required, it was demolished. Only the water treatment plant and the new sanitary sewer pumping station remained.

In the years between 1968 and 2005, the water treatment plant continued operating, an additional well was drilled, two original wells were abandoned and the plant was upgraded. The site contained the water treatment plant, Well #6 and the sanitary sewer pumping station.

By 2000, both the Ramblewood Water Treatment Plant and our other water treatment plant on Elbo Lane were nearing the end of their useful life. In 2005 a new water treatment facility was constructed on Elbo Lane to replace both. The new Elbo Lane Water Plant cost \$22 million. The Ramblewood Water Treatment Plant was taken out of service and demolished after the new plant was constructed and operating.

Now, our Ramblewood "Penny Bridge" site houses the Ramblewood Sanitary Pumping Station, Potable Well #6, and the Authority's first Solar Electric Generating Facility - which we expect will produce enough renewable energy to operate both for many years to come.

We've come a long way in the last 40 years.

Mount Laurel MUA's Ramblewood Site
(also known as Pennybridge)



Ramblewood Sewage Treatment Plant
Circa 1984



Ramblewood Facility Site (April 2010)

Home to the:
Ramblewood Sanitary Sewer Pumping Station
Potable Well #6
Ramblewood Solar Electric Generating Facility

INVERTERS – PV POWERED

The two (2) power inverters at this facility contain everything required to convert the 420 Volt DC power generated by the solar array into 480 Volt three-phase AC power as required for use by our facilities or export to the utility grid. Each inverter is rated at 260 kW and operates at 97.7% efficiency. They also incorporate self-diagnosis and fault detection systems to insure optimum efficiency and safe operation.

SYSTEM MONITORING – ACQUISITE DATA MONITORING SYSTEM

The Data Monitoring System collects real-time data from the inverters, the weather station and a revenue grade electric kilowatt-hour meter. This information is electronically monitored on-site and also downloaded to a hosted web site at fifteen minute intervals for compilation of energy production, for diagnostics and maintenance.

The operation of the photo voltaic system can be viewed at:
www.deckmonitoring.com/mt_laurel

NET METERING SYSTEM – PUBLIC SERVICE ELECTRIC

When the solar array produces more power than required on-site at any particular time, the excess is directed into the Public Service Electric grid for use by their customers. When the solar array is not producing sufficient energy to power our facilities, the additional power required is provided by Public Service Electric. The net metering system records this energy flow and Public Service Electric credits or debits the Authority's account accordingly.

The solar facility has been designed to produce 612,000 kW hours of electric annually. This is historically the amount of electric used at this facility. Therefore, the net energy usage at the end of each year should be zero. ☺

Self-Guided Tour

SOLAR PANELS – SHARP ELECTRONICS Model NU-U235F1

This solar facility is comprised of 2,254 monocrystalline silicon cell photovoltaic panels. Each panel is rated at 235 Watts and oriented due South at a 15 degree angle off horizontal.

The panels are mounted on driven steel posts and aluminum framework which avoided construction of individual concrete footings and helped to minimize costs.

Each panel is covered by a 25 year warranty.

COMBINER BOX AND PHOTOVOLTAIC POWER COLLECTION SYSTEM

DC Photovoltaic Power from the solar panels is collected and transferred to the inverters using wiring within sunlight resistant conduit. The solar panels are strung together in groups of fourteen (14). Approximately twenty-three (23) strings (a sub-array) are terminated in each combiner. Each sub-array is then connected directly to one of the Inverters.

WEATHER STATION – OBVIOUS WIRELESS Model A89WSW

This wireless weather sensing station is designed specifically for solar applications. It allows for “efficiency verification” of the solar cells by providing the ability to chart varying meteorological conditions and the particular effects each has on solar DC power production. The station is designed to continuously monitor:

- Ambient Temp, Humidity, Wind Speed and Direction
- Solar Radiance
- Solar Panel Cell Temperature

Data collected is transferred to the Data Monitoring System for use in monitoring and analyzing the performance of the photovoltaic system.



Lighton Industries, Inc.

General, Electrical, HVAC & Solar Contractors

Lighton Industries Inc. is a general, electrical and solar contractor, in business since 1980. Our present Lakewood, NJ complex serves as headquarters for 50+ employees with a satellite office in Staten Island, NY. As an equal opportunity employer affiliated with local labor unions, Lighton Industries is experienced in all aspects of construction, including electrical work, carpentry, mechanical, plumbing and process piping. This enables us to complete projects in a timely manner and with the highest regard to the wants, needs and exacting specifications of our customers.

Lighton entered the solar field in 2004. One of its first solar projects was the re-roofing and installation of solar panels on seven schools in Toms River, NJ (2.5MW-\$14,689,669). Since that time, we have completed numerous solar projects, the most recent for JJ Janssen Pharmaceuticals in Titusville, NJ (4.1MW tracker, ground mounted farm).

We thank the Mount Laurel MUA for giving us this opportunity to work with them in installing their 529.64 kW ground mounted system and look forward to working with them in the future on other projects.



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Since 1991, Advanced Solar Products (ASP) has been the region's premier engineering and construction firm in the field of solar energy and sustainable technologies, including their proprietary Solstice © mounting system. Principals of the firm have been New Jersey leaders in developing renewable energy policy and promoting "green" (LEED) construction.

ASP's experienced engineering team has designed and installed Photovoltaic (PV) systems for New Jersey public schools, municipalities, utility authorities, and commercial buildings. ASP offers start - to - finish service, and has recently installed over 80, 000 PV Modules (16 megawatts), enough to power over 2, 000 homes.

Comments from the Executive Director

Many people are responsible for the success of this project: our Board of Directors, the State, the Township, our Engineer, our contractor, our neighbors and especially our MUA employees.

Congratulations on a job well done. – *Pamela Carolan*



Richard A. Alaimo Associates

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For more than forty years, Richard A. Alaimo Associates, one of the member firms of the Alaimo Group has provided professional engineering, planning, permitting, surveying, architectural, and construction phase services to public clients throughout the State of New Jersey.

Alaimo Group possesses the multiple-discipline in-house engineering and support personnel to accommodate the varied needs associated with utility engineering services. We provide our clients with the full range of services needed to design public works and infrastructure projects: for water supply, treatment, and distribution; wastewater collection and treatment; solid waste handling, processing, and disposal operations.

Since our initial appointment as the engineers for the Mount Laurel Township Municipal Utilities Authority in 1971, the firm has grown, as the communities we serve have grown. We are pleased to have had the opportunity to share these thirty-nine years with the members of the Authority's board and their predecessors.



New Jersey
Environmental
Infrastructure Trust

Financing New Jersey's
"Water Quality Future"

The mission of the New Jersey Environmental Infrastructure Trust is to provide low-cost financing for the construction of environmental infrastructure projects that enhance and protect ground and surface water resources, ensure the safety of drinking water supplies, and promote responsible and sustainable economic development.

Working in partnership with NJDEP, the NJEIT leverages state funds, and repayments of federal funds with its own bond proceeds to make loans at the lowest possible cost. For over 23 years, the New Jersey Environmental Infrastructure Financing Program has been funding projects to improve water quality in New Jersey. The Financing Program has issued loans of more than \$5.34 billion for over 860 infrastructure projects throughout the Garden State. This has saved taxpayers and ratepayers nearly \$2 billion in financing costs.

Dedication Program

Welcome	Pamela J. Carolan Executive Director Mount Laurel MUA
Keynote Address and Introduction of Guests	Carl V. Buck, III Chairman Mount Laurel MUA
Presentation of Proclamation	Scott Rudder NJ Assemblyman Legislative District 8
Remarks	Michele N. Siekerka Assistant Commissioner Economic Growth and Green Energy New Jersey Department of Environmental Protection Jeanne Fox Commissioner New Jersey Board of Public Utilities Robert A. Briant, Sr. Chairman New Jersey Environmental Infrastructure Trust
Ceremonial Plug-In	Authority Board of Directors & NJ State Environmental Ambassador Miranda Pawline
Closing	Pamela J. Carolan

At the close of the ceremony, guests are invited to enjoy refreshments and to tour the facility.

Facility Description

The half-megawatt Ramblewood Solar Electric Generating Facility will annually generate enough electricity to operate the adjacent potable water well and sanitary sewer pumping station. Electricity costs for these facilities, approximately \$100,000 at the present time, will be eliminated.

Several state programs were utilized to bring this project to fruition. Financing for the solar system was obtained through the NJ Environmental Infrastructure Trust with 50% of the \$3.6 million project loan forgiven as part of the American Recovery and Reinvestment Act (ARRA). The electrical generation capacity of this facility has also been registered with the NJ Clean Energy Program allowing the Authority to sell solar renewable energy credits (SRECs) based on the amount of energy produced. In combination the elimination of electricity costs, ARRA loan forgiveness and SREC program incentives will result in an estimated 8-year payback for the project. The expected life of the solar voltaic system is more than 20 years.

The 2½ acre facility is comprised of 2, 254 solar modules, each rated at 235 watts, and two 260 kilowatt inverters. All electrical generation is electronically monitored on-site and downloaded to a hosted website for compilation of energy production, diagnostics and maintenance. The solar system is expected to produce 612,647 kilowatt hours of electricity annually, or enough to supply 130 homes.

In the event, that additional energy is required, during the night for instance, supplemental electricity is automatically supplied from the public utility electrical grid. During daylight hours, if more solar energy is created than can be used, the excess is automatically directed into the public utility grid for use by their customers. The public electric utility maintains a "net-metering" system on-site that records both the supplemental electricity provided and the excess solar electricity returned to their grid. These amounts are balanced annually.

The facility will provide both an economical and environmental savings to our customers.