

The Dirt on Clean Coal

By Richard Izzo

Around 300 million years ago, during the aptly-named “Carboniferous” Era, plants on the edges of countless sedimentary basins were buried by tectonic activity (and the resulting rise in sea level), and thus, coal (the staple of energy production for over a century) was created. Of course a lot of things have to happen over the 300 million years to turn the buried plant matter into coal.

Over time, heat and pressure cause the cellulose in the organic plant matter to change to peat and then eventually to four separate “grades” of coal: lignite or brown coal, sub-bituminous, bituminous and finally anthracite. Although all grades may be used as fuel, bituminous is by far the most common in the U.S. and produces the highest BTUs. Bituminous is also used as “coking” coal to produce steel.

Coal has been used to generate electricity in the U.S. since 1882 when it was the chief source of fuel for the Edison Plant in NY City. By the mid-20th century, coal was the leading fuel for electric power production across the country. Its use is on the decline (around 20% in the past 20 years) in favor of cleaner more cost



-effective fuels such as natural gas, but it is still widely used nationwide. According to the U.S. Energy Information Administration (EIA), as recently as last year, coal accounted for around 30% of all fuel used for generating electricity.

Unfortunately, coal continues to have the dubious distinction of being the “dirtiest” of all fossil fuels. Its production of greenhouse gasses ranks first among fossil fuels. In addition, the burning of coal releases a number of airborne toxins including mercury, lead, sulfur dioxide, nitrogen oxides, particulates, and various other heavy metals. Many of these same toxins remain as residual waste within the estimated 100-million tons of coal ash generated annually.

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Another Water Study for Long Island?

By Charles Rich

The Long Island Commission for Aquifer Protection (LICAP) recently (Nov/Dec. 2017) released a Draft Water Report subject to public comment, designed to guide implementation of sound water policies for the future of Long Island. Included in LICAP’s legislative mandate from 2013 was the creation of a Groundwater Resources Management Plan (GRMP). On Long Island, almost three million people depend upon groundwater beneath their feet as their sole source of fresh water.

As a precious resource ‘in motion’, groundwater is constantly affected by competing regional and local water supply management policies and waste disposal practices resulting from evolving land use across both Nas-



sau and Suffolk Counties (i.e. smart growth, urban-suburban interface, and the suburban-rural interface). As such, there has been, and will continue to be a pressing need to address water issues on a broad-based, bi-County geographic scale due to

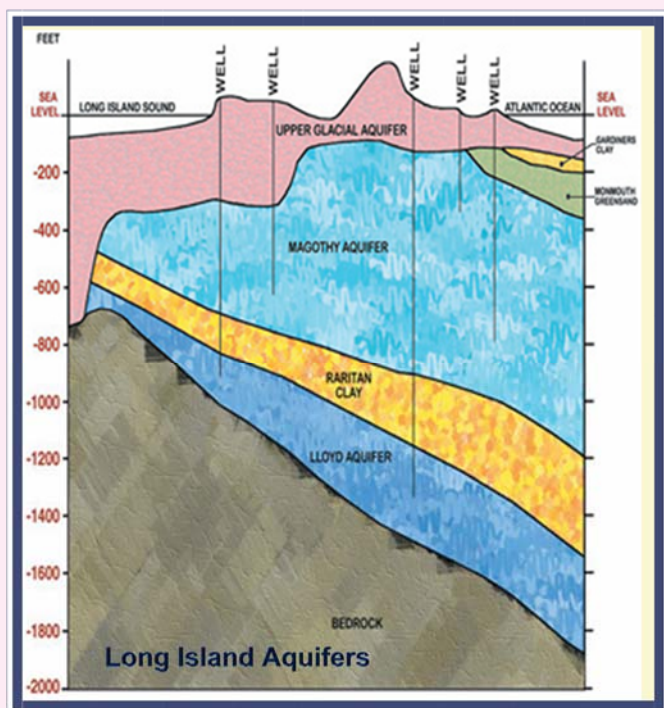
the proliferation of local and redundant governmental entities and decentralized land use controls.

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(Another... Continued from page 1)

For example, drinking water is pumped up from underlying aquifers locally, used, and in many cases re-charged (returned) back into the groundwater reservoirs from whence it came - and in varying degrees of chemical alteration from its original state. But the horizontal and vertical regional movement of ground water stored within Long Island's complex aquifers is controlled by hydrogeologic factors, and its occurrence neither respects political boundaries, nor competing water well pumpage serving evolving centers of population.

The draft GRMP summarizes a variety of investigations and fact-finding studies undertaken by government personnel from Long Island's groundwater community.



Numerous working reports were prepared by member agencies- some having jurisdictions across both Counties in a cooperative effort to update and interpret a wealth of existing information and discernible water quality trends from which to base future 'coordinated' water-related management planning. In short, the Plan's recommendations will influence how groundwater is pumped, treated, and discharged to protect the quality and quantity of the region's drinking water for the future.

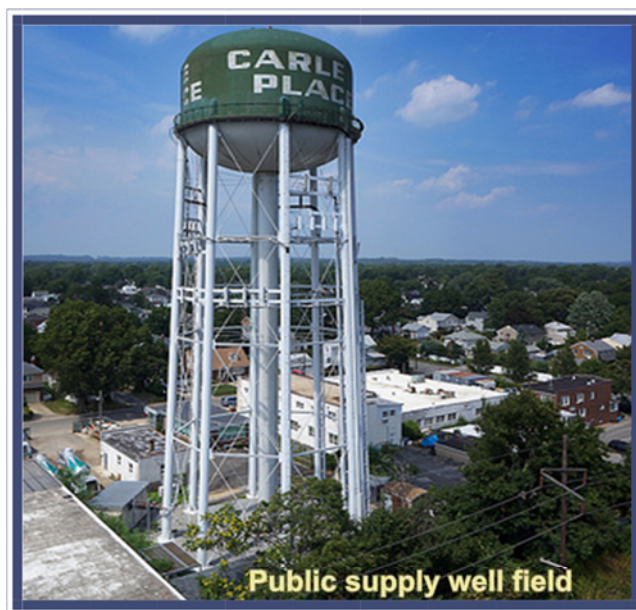
Nine of the Water Plan Recommendations, considered the most important by this author, and worthy of immediate implementation are listed on the following table:

'Water' we gonna do ?

1. **Optimize pumping operations near shorelines to minimize saltwater intrusion;**
2. **Implement conservation pricing at municipal public well water supply purveyors;**
3. **Establish guidelines for Best Management Practices to reduce peak demands for irrigation;**
4. **Manage public supply well pumpage in Queens because of possible negative impacts to Nassau;**
5. **Fund an agency to conduct groundwater monitoring and modeling using existing well network;**
6. **Remediate and/or contain groundwater contamination plumes;**
7. **Require NYSDEC, NCDH, & SCDH to review & provide comment on municipal planning board applications that may impact water resources through SEQRA;**
8. **Ensure any future pumpage caps on public suppliers are based on sound science; and**
9. **Reauthorize coordinated further LICAP legislation in Nassau & Suffolk County Legislatures;**

It would be extremely shortsighted to view this Water Report as just another study. Its direct value is whether it can be recognized as an informative working document meaningful to a diverse community of concerned stakeholders – subject to modifications when appropriate, but aimed at the common goal of fostering improved lifestyles for future generations, business growth, and the continued economic strength and vitality of Long Island here in New York State.

To view the full Report (236 pps), go to the LICAP website <http://www.liaquifercommission.com>.



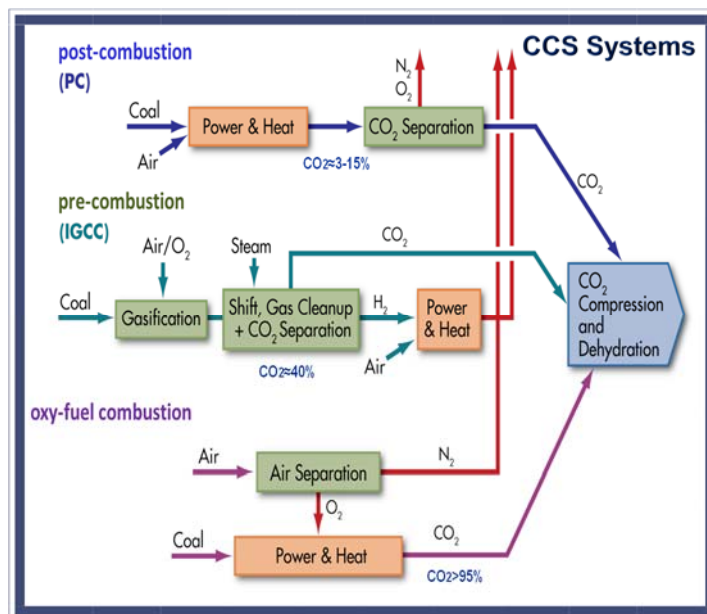
Public supply well field

(The Dirt... Continued from page 1)

Much of this coal ash winds up in ponds, lakes and landfills, potentially contributing to surface water and groundwater contamination. Coal mining itself produces contaminated wastewater and although government restrictions were previously in place to regulate mining waste disposal, many of these restrictions have been lifted over the past year by the current Administration.

So now that we've spent all this time talking about "dirty" coal, let's talk about "clean" coal. How is clean coal produced? Surely clean coal is much better for the environment than dirty coal, right? Proponents of coal have been tossing this term around for the past few years and have created some confusion among the general public that clean coal is actually a real type of coal. Unfortunately, it's not.

Banish from your mind, if you will, the image of hundreds of aproned minions furiously scrubbing away at chunks of the grimy black stuff to produce a shiny pristine fuel. No, clean coal, albeit a slick marketing ploy, is not actually a type of



include high pressure membrane filtration, adsorption/desorption processes and cryogenic separation. Pre-combustion removal is done through gasification which combines coal with steam and oxygen to produce "syngas" - a mixture of carbon monoxide and hydrogen. After the CO₂ is captured, it is injected into the ground in oil or gas fields for reuse in enhanced fuel recovery.

It is estimated that the cost for a coal-burning power plant using CCS technology is roughly 75% higher than for those with no carbon capture. With natural gas prices continuing to remain relatively attractive, the cost involved with cleaning coal emissions appears impracticable. In addition, neither CCS, nor any of the other "clean" coal technologies described above solve the growing problem of coal ash or mining waste disposal.

With this in mind, and with anthropogenic greenhouse gas production's increasing impact upon climate change, it would seem that the best way forward is to continue to phase out the use of coal and other carbon emitting fossil fuels in favor of more sustainable alternative energy sources such as solar and wind. Doing so would provide a "brighter" future and clear skies for all of us.



Contaminated coal mine waste

coal, rather it is a collection of technologies/processes designed to reduce coal emissions. Some of these have been around for decades including wet scrubbers to remove sulfur dioxide, electrostatic precipitators to remove particulates, and coal washing (yes they do wash it, sort of) in which the coal is ground up and mixed with liquid to allow impurities (metals, etc.) to precipitate out.

The most recent process employed for the reduction of greenhouse gas emissions is known as Carbon Capture and Storage (CCS). This innovative technology may be employed for all fossil fuels and involves the capture of carbon dioxide (CO₂) post or pre-combustion. Post-combustion, the CO₂ may be captured from the exhaust by absorbing it into a solvent which is later heated to release the gas for storage. Other methods for separating CO₂ after combustion



**Wind Farm
(alternative energy source)**

What's new at CA RICH

Firm President, **Charles Rich** continues his work with Engineers Without Borders (EWB) as Hydrogeologist / Mentor to assist the EWB University of Delaware (EWB-UD) Travel Team and locals with water resource exploration and development desperately needed to provide potable water to southern Malawi, Africa.

Vice President, **Richard Izzo** was featured in last month's "Year in Review" edition of the New York Real Estate Journal. Mr. Izzo discussed one of the Firm's most promising new projects for 2018.

Senior Project Manager, **Jason Cooper**, Project Scientist, **Jessica Proscia**, and Project Scientist, **Bill Fitchett** continue the Firm's remediation work under the NY State Brownfield Cleanup Program (BCP) and the New York City Voluntary Cleanup Program (VCP) on redevelopment sites in Far Rockaway, the Bronx, and Brooklyn. Remediation activities are expected to start on these sites in 2018.

Project Scientist, **Mike Yager** continues the Firm's economically-beneficial Tenant Inspection Program providing regularly-scheduled environmental monitoring and inspections of commercial tenant activities on behalf of property owners across Long Island.

Project Scientist, **Tom Brown** is successfully completing challenging regulatory compliance services for a long-time Client's metal-plating facilities on Long Island.

Warmly wishing all our clients and friends a New Year filled with Peace, Purpose and Prosperity.

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