

Spotlight

A publication of Spotts, Stevens and McCoy



SPOTTS | STEVENS | MCCOY

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Our work touches everyday life.

From the water you drink to the air you breathe to the buildings and communities where you live, work and play.

Spotts, Stevens and McCoy is a family-owned regional engineering, environmental, and surveying firm serving local and global clients. We engineer solutions for a better world. Our work touches everyday life; from the water you drink, to the air you breathe, to the buildings and communities where you live, work and play.

EXPERTISE

- Building Engineering
- Site and Civil Engineering
- Survey, Data Capture and Modeling
- Water and Wastewater Engineering
- Construction Phase Services

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The Dog Days of Summer

Did you know that the reference to the *dog days of summer* really has nothing to do with dogs? According to the Farmers' Almanac, the phrase is actually a reference to the period when the Sun occupies the same region of the sky as Sirius, the brightest star visible from any part of Earth and part of the constellation *Canis Major, the Greater Dog*. The ancient Romans believed it actually gave off heat and added to the Sun's warmth, accounting for the long stretch of sultry weather. Today, we know that the stretch from July 3rd to August 11th will be the hottest, most uncomfortable part of summer. We know you're dealing with rising temperatures and humidity and trying to stay cool ...we're here to help.



Reflections on the Dog Days of Summer

By Andrew Wengerd, PE, Senior Mechanical Engineer

The dog days of summer are a time when water in a crystal clear swimming pool can be refreshing or seem oppressive depending on the relative humidity conditions. I'm reminded of the incredible energy of water as it changes phase in evaporation and condensation.

Outdoors, water is helping to regulate the temperature of the planet in natural ways. At the 2014 ASHRAE conference in New York City, Dr. Mankiewicz of the Gaia Institute reminded the audience of the cooling potential of water. This cooling potential is available because of the phase change of water. There is also heat transfer that takes place during the phase change, although the energy associated with the phase change is often overlooked.

One phase change happens with the transpiration occurring in plants and trees. According to USGS, transpiration is simply the release of water from plant leaves. Much like we release water vapor when we breathe, plants do too. Trees draw water and nutrients from the soil with their roots; and some of this water is returned to the air by transpiration. As the tree releases water it evaporates, producing a cooling effect that can be experienced under the canopy of a tree.

Another phase change of water is the evaporation of the morning dew. The evaporation of water requires energy. This phase change produces a cooling effect as the energy is absorbed with the phase change. The phase change of 0.6 mm dew over ½ acre can be the equivalent of 10 tons of cooling.

Inside a building, mechanical equipment such as fans, cooling coils, and chillers are required to remove the moisture from air and create comfortable conditions. Recently our mechanical engineers have designed for low humidity laboratory environments. Our air conditioning calculations for treating summer time outdoor air are focused on removing moisture from the air and the energy required to do so.

During the dog days of summer we can appreciate the ways water is cooling and refreshing our lives.

Beating the Heat in the Dog Days of Summer

Dormitory HVAC Conversion | Marymount University

CHALLENGE | Existing dorm rooms in each building were served by fan coil units supplied by a two-pipe heating and cooling system. The scope of the project was to replace the existing fan coil units, greater than 270 individual units, and upgrade the existing two-pipe system to a four-pipe system in each building. The conversion was accentuated by the existing units being located in extremely tight spaces above the ceilings.

SERVICE | Mechanical Engineering and Construction Phase Services

SOLUTION | SSM provided detailed coordination with existing architecture and other utilities to successfully field survey and design the conversion. In addition, one of the Hall's conversions also included replacement of the existing air-cooled chiller with two new 35 ton water-cooled heat recovery chillers and the addition of a dry cooler. The existing boilers were replaced with a new 600 MBH boiler, and new pumps were provided for the heating system as well as the cooling system. SSM also worked closely with the owner and the contractor to facilitate completion of the project during the construction phase.

Ironton Rail: Rails to Trails | North Whitehall Township

CHALLENGE | Half mile rails to trails project along the former Ironton Railroad right-of-way. The project extended the existing Ironton Rail Trail from its terminus to the North Whitehall Township Building/Park Property.

SERVICE | Civil engineering design, permitting, bid and construction phase services

SOLUTION | SSM prepared construction drawings for the half mile project as well as prepared documentation to obtain a Joint Permit from the PaDEP for the construction of gabion walls within the floodway and of trail sections within the floodplain of the Coplay Creek. The trail was improved with compacted gravel and included a 40' span pedestrian bridge that crossed a tributary to the Coplay Creek.

Energy Audit & Systems Design | Children's Beach House

CHALLENGE | Identify energy conservation opportunities to an approximate 20,000 square foot, two story facility that holds summer and weekend camps for children with communicative disabilities and other special needs. Energy audits and evaluations extend for multiple years and with consideration that the existing mechanical equipment was reaching the end of its useful life.

SERVICE | Energy audit

SOLUTION | SSM conducted multiple surveys and energy audits of the existing facility over the course of a number of years. In accordance with these audits, SSM recommended several no cost and low cost strategies for saving energy as well as some capital improvement projects that would impact energy efficiency. SSM performed a life cycle cost analysis of the HVAC systems to compare replacement in kind with a geothermal heat pump system and a variable refrigerant system (VRF), determining the VRF system offered the lowest overall lifecycle. SSM further assisted in completion of grant applications to fund the project and design of the HVAC renovation



Dormitory HVAC Conversion
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Ironton Rail: Rails to Trails
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Funding Your Next Capital Project

C-PACE Financing offers a viable funding option for capital building upgrades. It continues to gain momentum in Pennsylvania as a great tool to finance energy efficient building improvements.

Our Energy and Sustainability Team is here to help. From the necessary assessment and modeling pre-requisites, to the project establishment and application process all the way to the technical components of taking your improvement project to completion- we've got you covered.

To help you get started in uncovering your opportunity for financing, we turned to the financing administrators to provide you with all the simple and sweet details you need to know.

What is C-PACE Financing?

Commercial Property Assessed Clean Energy (C-PACE) is an innovative financial tool for property owners to obtain low-cost, long-term financing for projects. C-PACE can provide up to 100% funding of total project costs by placing a special voluntary assessment on the property that repays the costs of the upgrades including equipment, labor and soft costs. Because C-PACE is attached to a property assessment, it is a very secure form of financing.

Who's Eligible?

Commercial properties, tax-exempt organizations, commercial portions of mixed-use buildings, and new construction projects.

What are Eligible Projects?

- **Energy Efficiency:** This includes HVAC upgrades, building controls, LED lighting, green roofs, geothermal energy, heat recovery, and high efficiency equipment such as chillers and heat pumps
- **Water Conservation:** This includes any project that will demonstrate water savings including high-efficiency equipment, condensate water reuse, low-flow fixtures and more
- **Renewable Energy:** This includes improvements such as solar power, wind power, fuel cell, solar thermal and methane gas from landfills and anaerobic digestion, and more.



What are Key Requirements?

- Project must be approved by your county's Program Administrator.
- \$100,000 minimum financing amount and 95% lien-to-value limit
- Financing term cannot exceed the weighted average expected useful life of the installed measures (max. 30 years)

Does this information speak to you? Let's get you started on acquiring your funding. Give us a call.



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For More Information: <https://pennsylvaniacpace.org/>

Six Reasons to Go Solar

It's good for the planet!

Electricity from solar lowers the amount of carbon emitted into the environment, reducing our impact on climate change. This results in less pollution and cleaner air!

Lower energy bills!

By installing a solar array on your building, you will pay less on your energy bill. Rather than buying electricity through your utility, you will be generating electricity on-site! This savings can be used to pay for the cost of the solar array.

Set's a good example!

Seeing a solar array makes it clear you are committed to a sustainable future, and hopefully inspire others to make environmental improvements in their own daily life!

Increase your property value!

Building with a solar array have a higher market value than similar properties without. Additionally, there is a higher resale value for owners!

Incentives!

The federal government currently is providing a 26% tax credit for residential and business solar arrays. This is known as the Solar Investment Tax Credit, which was extended until the end of 2022.

Set it and forget it!

Solar arrays have minimal maintenance requirements, as there are no moving parts. Additionally, the typical warranty lasts for a significant portion of the service life for the equipment.

Opportunities at SSM - join the team!

Visit ssmgroup.com for more information about these opportunities.

Construction Project Representative with 4-10 years of experience in the water, sanitary sewer, and stormwater field, including the inspections of mains, pump stations, treatment plants and paving projects.

Senior Design Engineer with eight or more years of water/wastewater experience to support our work on projects such as municipal treatment facilities, distribution systems, collection systems, sanitary and storm sewers.

Mechanical Engineer with at least seven years of experience in the design of HVAC, process piping and plumbing systems in industrial, commercial, and R&D type facilities.

Survey Technician to operate all field surveying instruments including robotic survey instruments, GPS surveying instruments, and auto-levels.

Project Manager with strong engineering and technical qualifications as well as experience working across multi-discipline technical teams.

Environmental Specialist responsible for conducting and supporting various watershed projects including source water protection and storm water management projects, through a combination of field data collection and GIS-based analysis.

Systems Administrator with 8 - 10 years' experience in an IT role, and a minimum of 5 years systems administration experience to join our Information Technology department.

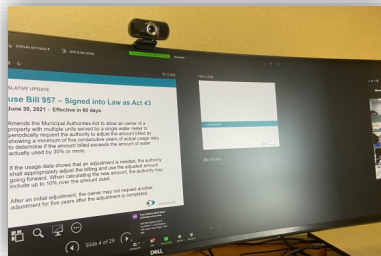


Staff News

Welcome to the team Chris DiPaolo, LEED AP BD +C. Chris joined SSM as an Energy Specialist in our Energy and Sustainability Services group. He will perform analysis of buildings and building systems to help clients reduce energy consumption and environmental impacts in cost effective ways.

Chris has a BS in Energy and Environmental Policy from the University of Delaware.

Where we've been this month



BCWSA Virtual Conference

Our team enjoyed a great virtual conference with Berks County Water and Sewer Association including some awesome presentations by five of our team members!



Manheim Farm Show Golf Tournament

It was a great day for golf! SSM was proud to be an Eagle Sponsor for the tournament, and enjoy a round of golf with our friends from Lehigh County Authority and SUEZ Water!

Where we'll be next month



PA Rural Water Annual Conference | August 24 - 26th

SSM is excited to be attending and presenting at the PA Rural Annual Conference. Information to sign-up to attend can be found at [PRWA Annual Conference | State College, PA](#)

Be sure to attend classes presented by two of our SSM experts:

Treating Your Water or Wastewater Operation like a Business
Trainer: *Darryl Jenkins, PE - Vice President and Chief Engineer*

This class covers the fundamental principles of system management for long-term viability and sustainability.

Source Water Protection Tools & Technology
Trainer: *Al Guisepppe, PG - Director, Water Resources*

This course will provide an overview of Pennsylvania's SWPTAP program and new technologies, such as online mapping services, potential sources of contamination notifications, crowd-sourcing applications, and data management dashboards, to help you develop more effective source water protection management strategies.