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2005 Golf Outing

Under sunny skies, 120 golfers took to the links once again on the final Friday in July for ARRO's annual golf outing. Long hailed as ARRO's most popular client appreciation event, the day began with a 12:00 p.m. shotgun start at Overlook Golf Course in Lancaster County (PA) and concluded with hors d'oeuvres and dinner attended by nearly 150 persons.

Kevin McClarigan, representing Paradise Township (Lancaster County, PA), garnered low gross honors with a score of 71. Bud Brown, of ARRO's Mechanicsburg office, earned low gross bragging rights among ARRO employees for the third time in four years with a score of 77 (a full nine strokes below of the next ARRO employee).



While no one captured a hole-in-one and the resulting \$10,000 prize, participants were recognized for many other achievements on the course such as low net, closest to the pin, and longest drive. Vendor contributions in the form of door prizes and hole sponsorships added to the purse. Mulligan proceeds totaling \$270.00 were contributed to the Arthritis Foundation.



ARRO

Dynamics

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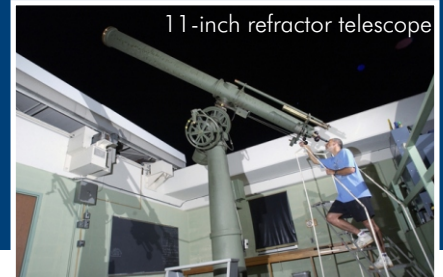
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ARRO Stormwater Engineer

turns

Stargazer



As a youth growing up in the 1960s, Jeri McClune, a civil engineer in ARRO's Lancaster office, slept outside in the backyard under the stars during the warm summer months, wondering if there could be an end to the universe. Jeri, who bought his first telescope, an eight-inch reflector a mere five years ago, has rapidly graduated to larger toys.

On the third Monday of each month, about one hour after sunset (weather permitting), Jeri can be found at the controls of two telescopes at Franklin & Marshall College's Grundy Observatory in Lancaster. Located on Baker Field at the north end of Wilson Drive, Grundy Observatory does not resemble a typical observatory. In lieu of the traditional dome, Grundy Observatory has a flat roof, one-half of which rolls back to permit viewing.

There are two telescopes at the observatory a 16-inch reflector and an 11-inch refractor. The 11-inch refractor was built in 1884 by Alvin Clark, an American known as the best lens maker in the world at that time, and perhaps ever. According to Jeri, the refractor is most often used to view items that can be seen with the naked eye and/or items with known locations, while the reflector can be used to look up any item in the sky, visible or invisible, for which one has the address. (The address is the set of coordinates similar to east-west-north-south that are set with the sky and appear to move as the earth rotates.)

Celestial viewing is cyclical because of the Earth's orbit around the sun; presently, the planets Saturn and Jupiter are good viewing during the spring months – particularly Cassini's Division (the black gap between rings

A&B on Saturn) and Jupiter's weather bands and the shadows of its moons. Also among Jeri's favorites for prime visibility are planetary and

emission nebula, globular and open clusters, and double stars. Jeri prefers winter sky gazing--the sky is clearer and the mosquitoes are not biting. His only lament is that viewing is somewhat limited at the Grundy Observatory because of excessive background light from Park City Center and the City of Lancaster.

High school students are among the observatory's most frequent visitors; in fact, Jeri notes that one J.P. McCaskey High School teacher accompanies pupils on a regular basis. In August 2004, when Mars was at its closest point to Earth in 50,000 years, Jeri hosted special viewing sessions on three consecutive evenings that drew over 150 people per night between 11 p.m. and 1 a.m. The observatory is also open for scouts and church groups by appointment.

Jeri is also one of seven part-time planetarium operators at the North Museum of Natural History & Science in Lancaster. While most of the planetarium shows are pre-recorded multi-media presentations consisting of DVDs and slides that are run on a rotating basis, the Night Sky Tour is narrated live by the operator, typically focusing on constellations, planets, and other items of celestial interest with photographs from the Hubble space telescope at the conclusion. Jeri commented that he participated in an equipment training session and underwent an independent review to polish his skills at locating constellations prior to his first live show at the planetarium, touted as central Pennsylvania's largest.

There are usually two shows on Fridays, four shows on Saturdays, and three shows on Sundays, with subject matter geared to varying age groups ranging from pre-schoolers to adults. One of Jeri's favorites is Astro-Tots, a 12-minute show that combines song and stuffed animals to introduce three and four year olds to seasonal constellations such as Leo the lion, Canis Major the dog, Pegasus the flying horse, and Cygnus the swan as well as explains how the Earth's rotation causes day and night. Between shows, Jeri is stationed in the Hall of the Cosmos & Technology Theater to answer questions about the space exhibits and assist patrons with downloading images from Hubble.



11-inch refractor telescope

For questions or comments, please contact us at info@thearrogroup.com.

this' n that

Upper Merion & ARRO Host Operators

On September 16, 2005, ARRO and Upper Merion Township (Montgomery County, PA) hosted the Eastern Pennsylvania Water Pollution Control Operators Association quarterly meeting. The day started at the Trout Run water pollution control facility in Upper Merion Township, followed by lunch and a business meeting at the Camelot in Bridgeport, PA.

Matt Brown, ARRO's president and chief executive officer, spoke to the 150 attendees about the unique aspects of Upper Merion Township's wastewater facilities and the Township's Act 537 official sewage facilities plan that focuses on existing and future collection and conveyance issues, wastewater flow, and capacity analyses to accommodate 10-year growth projections. Located northwest of the City of Philadelphia, the Township has two water pollution control facilities with the collection and conveyance system divided into three parts by major drainage area.

Did You Know That?

- Through the Federal Emergency Management Agency's (FEMA) Cooperating Technical Partnerships (CTP), local municipalities are critical in establishing both existing and future flood hazard areas shown on the Flood Insurance Rate Maps (FIRMs).
- The Nation Flood Insurance Programs (NFIP) Community Rating System (CRS) provides discounts of up to 45% on flood insurance premiums in those communities that establish floodplain management programs that go beyond NFIP minimum requirements.
- FEMA's Map Modernization plan will bring up-to-date, digital-format flood hazard data that can be accessed by users over the internet in a Geographic Information System (GIS) format.

For more information on the above floodplain issues, contact Freddy Lutz at 484-664-7310, or go to FEMA's website at www.fema.gov.

Act 537 Planning Reminder

When completing municipal or regional Act 537 Sewage Facilities Planning, do not forget to conduct the necessary on-lot sewage disposal system (OLDS) surveys and the potable well water sampling. These surveys are necessary to assist the municipality or authority in identifying areas of need for facilities planning purposes. Be sure to follow the guidance and instructions outlined in the PA DEP's "Act 537 Sewage Disposal

Needs Identification Guidance" documentation found on PA DEP's website at www.dep.state.pa.us.

OLDS Surveys can be completed by two methods:

- Door to Door
- Mail Survey with random follow-up inspections

Well sampling can be conducted by selecting random properties that are served by private wells. Testing for fecal coliform, total coliform, and nitrates must be conducted. The samples collected are to be tested by an outside-certified laboratory. Sampling is free to the affected property owners and the results are available to those who request them.

What percentage of the results makes a valid OLDS survey or well sampling program?

OLDS or Wells in the Project Area	Percent Sampling/Surveying Required
Up to 50	50 percent
51 to 100	35 percent
101 to 500	25 percent
501 to 1,000	20 percent
Greater than 1,000	15 percent

Source: PA DEP's "Act 537 Sewage Disposal Needs Identification Guidance"

ARRO Sponsors Award

Charles A. Fagan, II, P.E., executive director of the East Norriton-Plymouth-Whitpain Joint Sewer Authority in Montgomery County, was honored as Authority Employee of the Year by Pennsylvania Municipal Authorities Association (PMAA). The award, sponsored by ARRO, was presented to Charlie during PMAA's annual banquet on September 13, 2005 by ARRO's President & Chief Executive Officer, G. Matthew Brown, P.E., DEE at PMAA's 63rd annual conference and trade show held at the Hershey Lodge & Convention Center. The award recognizes an authority employee who is an active member of PMAA and engages in community service.

In addition to receiving a personalized plaque, Charlie designated that the monetary award in the amount of \$750.00 be presented to Friends of the Wissahickon, a non-profit organization in Philadelphia whose mission is to preserve the natural beauty and wildness of the Wissahickon Valley and stimulate public interest therein. The 1800-acre forested gorge, designated a National Natural Landmark, is part of Philadelphia's Fairmount Park system.

ARRO provides advice, design, project management, consulting, and operations services for a wide range of infrastructure including water, wastewater, and transportation systems.

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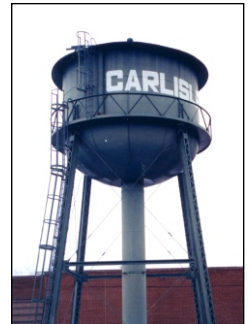
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ARRO Evaluates Water Storage Facilities

ARRO recently evaluated water storage facilities within the Borough of Carlisle (Cumberland County, PA) water system. Current facilities include two in-ground reservoirs at the booster pumping station site and three elevated tanks serving the distribution system. The scope of the evaluation included physical inspections of each of the elevated tanks (including the treatment facility's backwash water tank) as well as an engineering analysis of additional storage capacity required to meet both current and future needs. Projected storage needs are assumed to mirror existing storage requirements since water use has not increased over the past eight years according to the system's annual water supply reports.

In addition, ARRO assessed the potential placement of advertisements and the impact of existing and potential cellular telephone antennas on the elevated tanks. Inspection of the three elevated tanks and the backwash tank was coordinated with Tank Inspection Services of Hughesville, PA. Subsequent to the field evaluation, ARRO made recommendations about maintenance, upgrades, and expansion to existing facilities as well as the need for

additional storage facilities. Recommendations include demolition of one of the existing tanks as well as reconditioning of interior and exterior surfaces of the remaining tanks over a 10-year period.



As part of the existing storage capacity assessment, ARRO's engineers calculated the total capacity for storage as well as the total usable capacity given the need to meet certain residual pressures within the distribution system. PA DEP requirements for finished water storage and fire flow demand served as the basis for storage capacity requirements. ARRO staff members created a desktop model to determine the amount and type of additional storage capacity required to meet PA DEP's standards for finished water storage. Borough officials are presently considering report recommendations.