

# MDE Environment

Maryland Department of the Environment

December 1998

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## The Chemical Accident That Wasn't *Emergency Exercise Helps Prepare for the Worst*

by Suzanne Bond

Emergency lights flashing, the police car skidded to a stop a safe distance from the devastating accident at the Port of Baltimore. A shipping container from the SS John W. Brown had been dropped from a crane onto a truck parked dockside, crushing the cab and killing the men inside. The driver of the first police car on the scene sat slumped over his steering wheel, overcome by fumes from the dangerously reactive and flammable nickel carbonyl that had spilled during the container's fall. In the water, a man struggled to stay afloat while 55 gallon drums purportedly holding nickel carbonyl drifted in the waters alongside the SS John W. Brown.

The scene described above was not an actual accident, but one contrived and staged by the South Baltimore Mutual Aid Plan (SBIMAP) to test the skills and equipment of agencies and businesses that respond to chemical accidents.

The exercise was designed to build teamwork between SBIMAP members who must work together to contain chemical accidents. Through these yearly practice sessions, member organizations have developed a trust in each others' skills. With that trust in place, they work efficiently to save lives and protect the environment.

"No one is strong enough, knowledgeable enough or has the resources to handle a large chemical emergency by themselves," said Buzz Melton, senior environmental engineer with FMC Corporation and leader of last month's exercise. "No chemical emergency is pretty, but by working together we have enhanced our ability to respond."

As the incident cleanup unfolded before observers and the media, firefighters laid protective material

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A and A Environmental staff member in protective clothing and breathing apparatus cleans up last month's staged chemical spill.

## Maryland's PM2.5 Monitoring Network *Public Comment Sought*

In accordance with 1997 revisions to the Clean Air Act, the Maryland Department of the Environment is in the final design stage of developing Maryland's Particulate Matter 2.5 (PM2.5) network to monitor fine particulates. Fine particulates are pieces of air-borne dirt with a diameter less than 2.5 microns (PM 2.5) that have been linked to a wide range of health effects, especially in children, the elderly, and people with cardiopulmonary and respiratory diseases, such as asthma.

The U.S. Environmental Protection Agency (EPA) revised the air quality standards for outdoor levels of fine particulates because of current scientific knowledge of the serious health effects of this pollutant. EPA also revised the way exceedences are

calculated for the existing standard for large particles, known as PM10 (particles with a diameter less than or equal to 10 microns).

EPA grant money is expected to support a large part of MDE's purchase, installation, and operation of the new PM2.5 air monitors.

Maryland's planned PM2.5 monitoring network will consist of 20 sites. Fifteen of these sites will be operational early in 1999 and the remaining five sites will come on line by January 1, 2000. The monitors have been sited following U.S. EPA guidelines for monitor placement. The first 15 monitors will be placed at existing air monitoring sites currently measuring

*Did you know...that a micron is equal to 1/70<sup>th</sup> of a human hair?*

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## SBIMAP DRILL

to contain the spill on the dock. A dive team from A and A Environmental, assisted by Baltimore City Fire Department personnel worked to safely contain the drums that fell into the water. MDE Emergency Response experts worked by boat to ensure that waterfowl that came close to the spill were removed from harms way. Staff from A and A Environmental, outfitted in protective space age green suits complete with oxygen tanks, showed their expertise when they entered the

fallen container and eased 55-gallon drums oozing "nickel carbonyl" into safe overpack containers.

Just about two hours after the first fire trucks arrived on the scene, the spill had been contained and the emergency declared over. The 1998 SBIMAP exercise had, once again, successfully tested those who protect Maryland's citizen and environment from a chemical emergency.

Scenarios such as this have been testing SBIMAP members for the past 14 years. The 32-member organization includes state and local

government agencies, private industry and trade organizations. SBIMAP was formed in early 1983 out of concern for community and industry neighbors by the Baltimore City Fire Department and a group of chemical manufacturers and petroleum transfer and storage companies located primarily in the South Baltimore area. Now SBIMAP has grown to include members from Western Maryland to the Eastern Shore. SBIMAP's objectives include fostering chemical emergency preparedness, rendering mutual aid in the

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## PM2.5

either PM10 or ozone that already meet the U.S. EPA criteria for PM2.5 placement. The criteria for siting these monitors include high population density, an orientation toward high levels of PM2.5, or a combination of both.

The monitors will be capable of sampling for 10 days without human support, although air monitoring staff will visit the sites every third day to collect background support data (temperature, barometric pressure, and relative humidity). Information gathered from the air monitors will be used to determine whether areas throughout Maryland meet the new standards for fine particulates. Once attainment and nonattainment areas

have been determined, MDE will begin its efforts, including stakeholder input, to plan programs that will reduce particulate concentrations and lead to cleaner air.

Earlier this year, MDE submitted a draft monitoring network design to the U.S. EPA. As part of the

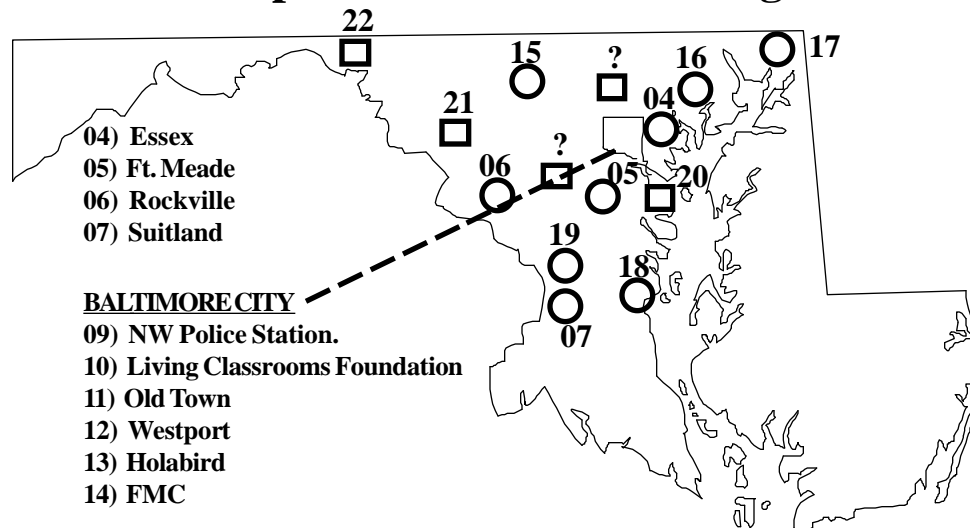
process to design the network, the department continues to seek public comments on the proposed monitoring network. Comments may be sent to Richard A. Wies, Maryland Department of the Environment, 2500 Broening Highway, Baltimore, MD 21224 or rwies@mde.state.md.us.

## The Standards...In a Nutshell

	<u>PM10</u>	<u>PM2.5</u>
<u>Yearly Average Standard</u>	50 ug/m3	15 ug/m3
<u>24-Hour Average Standard</u>	150 ug/m3	65 ug/m3

Following the U.S. EPA's new standards, Maryland will now be monitoring even smaller pieces of invisible particles in the air, requiring lower levels than ever before while striving for attainment with these standards on a more contiguous basis.

## 1998-1999 Proposed PM2.5 Monitoring Network



- 04) Essex
- 05) Ft. Meade
- 06) Rockville
- 07) Suitland
- BALTIMORE CITY**
- 09) NW Police Station.
- 10) Living Classrooms Foundation
- 11) Old Town
- 12) Westport
- 13) Holabird
- 14) FMC
- 15) South Carroll
- 16) Edgewood
- 17) Cecil
- 18) Davidsonville
- 19) Bladensburg
- 20) Riviera Beach
- 21) Frederick Air Park
- 22) Hagerstown

○ 1998 PM2.5 site

□ 1999 PM2.5 site



## Maryland Achieves 32 Percent Recycling Rate

by Virginia Lipscomb and Bonnie Berardelli

Using regional networks and innovative approaches, Maryland has achieved a state-wide recycling rate of 32 percent, passing the statewide recycling goal of 20 percent mandated by the 1988 Maryland Recycling Act. By 1990, all Maryland's jurisdictions (23 counties and Baltimore City) and State agencies were required to develop a recycling plan that reduces, through recycling, a portion of the solid waste stream. By 1994 Jurisdictions with populations greater than 150,000 were required to reduce solid waste by 20 percent, while jurisdictions with populations less than 150,000 were required to reduce solid waste by 15 percent through recycling.

Many of Maryland's jurisdictions have been very creative in the way they have reduced waste and almost all have exceeded the minimum goal set by law. Rural counties have come together to develop a regional network of colorful, igloo-shaped drop-offs. Curbside programs now serve almost 80 percent of Maryland's citizens. A variety of programs have been developed to divert organic materials, one of the largest components of

Maryland's solid waste stream, from disposal. Crab waste from packers, a former landfill problem, is now turned into beneficial compost. Suburban counties are composting their residents' yard trimmings and providing mulch to residents. Recycling is now a well-established component of every Maryland jurisdiction's solid waste management plan. State Agencies also have pitched in and recycled 40,000,000 pounds, which calculates to a 23 percent recycling rate, through the State Agency Recycling Program.

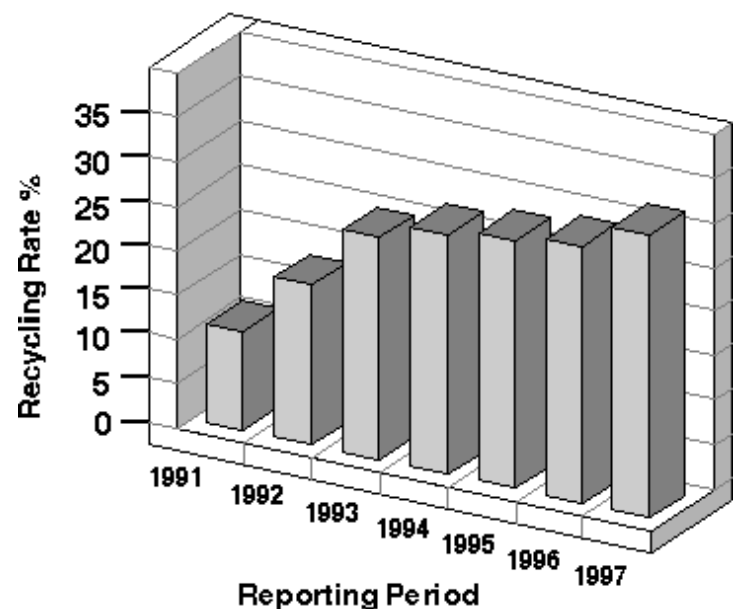
The 32 percent statewide recycling rate does not represent the total amount of recycling that is taking place in Maryland. Businesses and local governments have continued to seek recycling opportunities beyond what counts toward the Maryland Recycling Act rate. In fact, an additional 1.2 billion pounds of other materials were reported as being recycled. This includes a wide variety of materials from tree stumps, which were ground and used as mulch to ash used in highway construction projects. Because the Maryland Recycling Act does exclude

recycling of certain materials as counting toward the reported recycling rate, not all counties track and report this recycling. MDE encourages the recycling of all materials because of the environmental benefits which recycling provides and includes these additional recycling efforts in its reports.

For information about county drop-off sites; the names, addresses and

phone numbers of county coordinators; yearly recycling statistics; and tire playgrounds, try our web site at <http://www.mde.state.md.us/was/recycle/index.html>. At this site you will also find access to a variety of fact sheets and other publications as well as links to other web sites (county recycling pages) including links to fun recycling pages for kids.

### MD Recycling Rates



## Restoration Progress In the North Branch of the Potomac River



**A mountain of coal 'gob' was just one of the environmental problems faced in Kempton, Maryland as reclamation began on the abandoned Kempton mines.**

by Quentin Banks

Western Maryland community leaders, elected officials, coal industry officials and representatives from local, state and federal agencies recently gathered to hear of progress being made in reversing decades of damage to many of the streams and tributaries of the North Branch of the

Potomac River. With the steady restoration of the North Branch watershed, a world class fishery for trout and small mouth bass will eventually be established in these once uninhabitable waters.

"We have accomplished an incredible amount of work for which we are very proud," said John Carey, director of MDE's Bureau of Mines.

The North Branch of the Potomac River, from its headwaters to Jennings Randolph Lake near the Maryland-West Virginia border, has suffered from acid mine drainage from abandoned coal mines since the end of the nineteenth century. Acid mine drainage is acidic water that is formed when coal seams are exposed to air and water. Acid mine drainage seeps into ground and surface waters degrading the water quality and devastating the living resources of the receiving streams. Many of the acid mine drainage problems that Maryland and other states face are as a result of actions that occurred before the coal industry was regulated.

In the upper reaches of the North Branch watershed, which represents a high percentage of the mainstem flow, the damage from acid mine drainage is most serious. The problem is complicated because the watershed consists of 70 subwatersheds, 20 of which produce acid mine drainage in 52 sites. The major acid producing sites in Maryland are the underground Kempton Mine that feeds Laurel Run, the Vindex Mine that feeds Three

Forks Run, and direct discharges to the North Branch at Shallmar and Kitzmiller.

In 1992 MDE sought ways to eliminate the impacts of acid mine drainage in the North Branch above the Bloomington Dam to improve water quality at Randolph Jennings Lake to accommodate recreational fishing. Fisheries management experts in Maryland and West Virginia set objectives for improving water quality by examining the potential of each branch to support aquatic life and determine the biological tolerance levels of certain species of fish that might be returned. As part of the plan, four lime dosers were installed in the North Branch watershed to treat the acid discharges that flow unabated from abandoned surface and deep mines. At present, there are five dosers in operation and a sixth under construction at an air shaft of the Kempton Mine complex near Laurel Run.

One of the major pollution sources in the North Branch was the Kempton

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# Havre de Grace to Implement BNR

## Trib Team Major Player in Nutrient Removal Upgrade

by Marya Levelov

Thanks in part to the strong support of the Upper Western Shore Tributary Strategy Team, the City of Havre de Grace in Harford County will implement Biological Nutrient Removal (BNR) at its city's wastewater treatment plant to help reduce nutrients entering the Chesapeake Bay.

The Point Source Workgroup of the Upper Western Shore team, which includes all of Harford County, and portions of Baltimore, Carroll and Cecil counties, set as a top priority monitoring progress on wastewater treatment plant upgrades. In response to the team's concerns, MDE met with the Upper Western Shore team in 1997 to discuss the status of the BNR program and in particular to provide an overview of the point source implementation in the Upper Western Shore tributary.

As of August 1998, of the 65 plants identified as eligible to obtain funding, all but six have either installed BNR or have signed cost-share agreements with MDE. This is a greater than 91 percent voluntary participation rate. MDE's goal is to implement BNR at all 65 plants by the year 2000.

There are six major plants in the Upper Western shore tributary. At the time of the initial meeting, the

Joppatown plant was on line. Two other plants, Sod Run and the Town of Aberdeen had started BNR construction. As a result of the meeting, members of the group and the chair of the Upper Western Shore Tributary Team, Charlie Conklin, and the chair of the Point Source Workgroup Pat Pudelkewicz decided to concentrate on the remaining three facilities. The team was concerned that the Havre de Grace plant, Aberdeen Proving Ground and Edgewood Arsenal plants may not be upgrading to BNR by the year 2000.

MDE staff and the Upper Western Shore Point Source Workgroup discussed possible alternatives to ensure implementation of BNR at the remaining three plants. First, MDE coordinated a meeting with the staff of the Aberdeen Proving Ground facility. Progress as well as obstacles to BNR implementation were discussed. This facility requires federal funding to implement BNR. To expedite federal funding, the Aberdeen Proving Ground staff advised the group that a BNR upgrade must be a mandatory requirement, which is a departure from current MDE policy.

As a result of these meetings, the department issued NPDES permits with nitrogen limits of 8 mg/l for both federal facilities. In accordance with

the permit, these facilities must implement BNR by the end of 2000. Currently, the Army is privatizing its facilities. MDE and Upper Western Shore tributary team continue to monitor progress of either upgrade or privatization at these two federal facilities.

The remaining municipal facility in the Upper Western Shore tributary, Havre de Grace wastewater treatment plant had completed preliminary engineering in 1996. However, the project was not moving forward, and needed the support of the elected officials to proceed with the final design and construction.

MDE staff coordinated a meeting with the City of Havre de Grace departments of Public Works and Planning, the City Manager, the tributary team point source workgroup members and the chair, Mr. Conklin, to discuss progress, issues, challenges and opportunities for BNR implementation at the city's plant. MDE staff discussed grant and SRF funding and management of the project. The Tributary Team members offered their assistance to the city. All of the attendees focused on the specific details of the upgrade, the cost, BNR eligibility determination, impact on user fees, and need for the upgrade as a part of the economic

development and downtown revitalization efforts of the City.

After several meetings, the Havre de Grace city council and the Mayor voted on November 3 to proceed with the final design of the project.

The Upper Western Shore Tributary Team demonstrated a strong commitment to the BNR mission and its members spent considerable time and effort in making sure that the local government heard their voices. The support and presence of the Tributary Team members at the various meetings with MDE and the city officials was a key to the favorable vote by the Mayor and City Council.

The BNR Program began in 1984 as one of the original Chesapeake Bay clean up initiatives. With a goal to reduce nutrients from point sources, MDE's 50 percent cost-share program funds BNR and chemical removal at all wastewater treatment plants with flow equal or greater than 500,000 gallons per day (gpd). Maryland developed tributary strategies and teams of citizens, industry, agricultural and government representatives to reach a 40 percent nutrient reduction goal in each tributary. BNR has been adopted as the main nutrient reduction option for point sources of nitrogen and phosphorus.

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deep coal mine which is actually nine separate mines in Maryland and West Virginia which form a complex underground system covering approximately 10,000 acres. One of these mines was located in the Town of Kempton at the headwaters of the North Branch and produced 5.5 million tons of coal before it was abandoned in 1950. Coal that was brought to the surface was screened for quality. Pieces that were fit for fuel were put in rail cars and transported to customers. The leftover coal, or gob, containing rock and shale was dumped along the embankment of the North Branch. The acid mine drainage from the gob impacted more than 28-acres of upland and five-acres of wetlands in addition to degrading the water quality of the North Branch Swamp, a "Wetland of State Concern." In addition to the 160,000 cubic yards

## Restoration Progress



**PICTURED RIGHT** -- 75 tons of garbage had to be removed before the mountain of gob could be regraded, covered with lime and topsoil, and re-vegetated.

**ABOVE** -- the same site after reclamation. A newly constructed wetland exists where garbage and gob once reigned.



of gob, which created a public health and safety hazard, the embankment became a community dump site containing approximately 75 tons of trash.

The Town of Kempton reclamation was completed in October. The 75 tons of trash was transported to the Garrett County landfill. The gob was regraded away from the embankment, covered with lime and topsoil and re-vegetated. The vertical mine shafts were sealed and five-acres of wetlands was constructed and re-vegetated.

In the five years since the dosers were installed, scientists are observing a return of macro invertebrates which shows that the habitat is being restored. Native fish species are recolonizing the waters and in 1994, for the first time in 100 years, trout were successfully stocked upstream of the Jennings Randolph Lake.



# Aquifer Model Yields Favorable Information for Farmers

by John Smith and Mat Pajeroski

After a comprehensive review of existing water appropriations permits, the Maryland Department of the Environment (MDE) has resumed processing new agricultural use water appropriation permit applications to withdraw water from the Piney Point aquifer thanks to a simplified approach to a complex computer modeling process.

The computer model was created by MDE to help avoid potential water allocation conflicts in the Piney Point aquifer that extends from North Carolina to New Jersey. Within Maryland, it provides potable water in Calvert and St. Mary's counties on the Western Shore and in Queen Anne's, Talbot, Caroline and Dorchester counties on the Delmarva Peninsula. The aquifer is an important source of water for homes served by private wells and other potable water users in Caroline County.

While modeling programs that allow a comprehensive evaluation of an aquifer have been available for two decades, these programs do not always meet the needs of the regulatory community. They may generate models that are too difficult to maintain and apply, they can require calibration information that may be inaccurate or unavailable, and they incorporate geologic interpretations that may be difficult to change if later found to be incorrect.

The difficulties in developing, calibrating and maintaining these models usually outweigh their advantages over simpler, analytical techniques, which are normally sufficient for evaluating permit applications.

In this case, increasing numbers of farmers were seeking water appropriation permits from confined aquifers in areas where the yield from the water table aquifer was low. MDE noticed an increase in the number of requests to withdraw water from the Piney Point aquifer for irrigation, and county officials raised concerns that large withdrawals for irrigation could pose a problem for drinking water supply wells. The review of applications to irrigate with water from the Piney Point aquifer was suspended in May.

A simple, two layer, quasi-three dimensional steady-state model using the United State Geologic Survey (USGS) modular finite difference model, MODFLOW, was adopted to overcome some of the difficulties inherent in using a computer model.

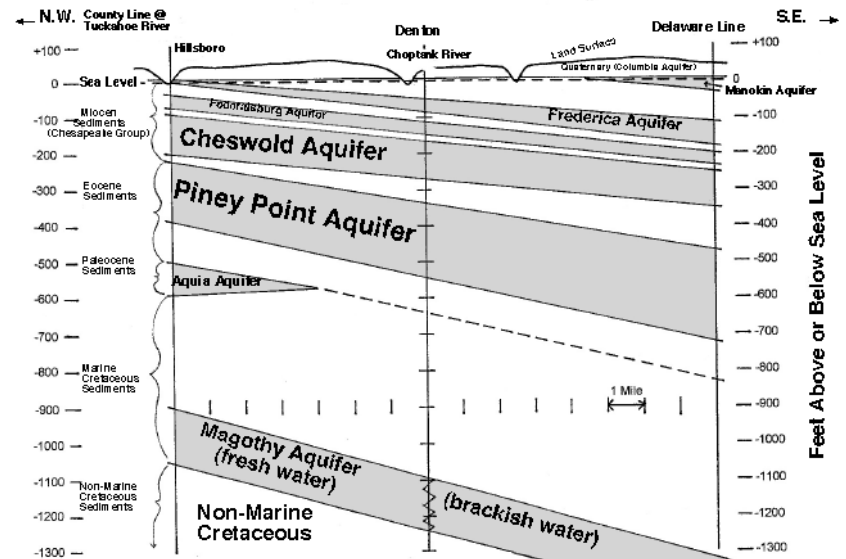
An even 5,000-foot grid size aligned with the Maryland State Plane Coordinate System was used to improve maintainability. Supplementing USGS water level measurements with potentiometric surface maps developed from well completion reports during the calibration period enhanced the accuracy of the model. The calibrated model was used to evaluate the impact of all existing and currently proposed water appropriation permits.

The Piney Point review has shown that the cumulative impact of permits issued recently for the agricultural appropriation of water from the aquifer presents no problems for the existing users, and has had no unreasonable impacts on the Piney Point aquifer as a whole. The department generally directs large irrigators, such as farms, on the Eastern Shore to use shallow wells, which use water from the water table or uppermost aquifer. The deeper, confined aquifers, such as the Piney Point aquifer, are reserved for drinking water supplies because

they are more protected from surface contamination.

The department will continue to direct large users of irrigation water to the surficial aquifer in areas where it is sufficient, but it currently is not necessary to prohibit the access of large water users to the Piney Point aquifer. The impacts of individual applications to use water from the Piney Point aquifer will be evaluated on a case-by-case basis, and the model that the department recently developed will be used to estimate the cumulative effects of appropriations from the aquifer.

**Geological Cross-Section of Caroline County Along the Route of MD 404** (Geological depths mostly from Cushing, Kantrowitz, and Taylor, 1973.)



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## SBIMAP Exercise



Bob Swann (right), MDE's Emergency Response training specialist suits up and receives direction from MDE's Chief of Emergency Response Alan Williams.

event of an emergency and facilitating cooperation between citizens groups, public agencies and industry. The Steamship Trade Association and the Port of Baltimore co-sponsored this year's marine scenario exercise. Hazardous material incidents aboard

vessels present emergency personnel with unique circumstances. Last month's drill was designed to familiarize SBIMAP members with a port environment, according to James White, acting executive director of the Maryland Port Administration.

## 14th Annual Environmental Education Conference



The Maryland Association of Environmental and Outdoor Educators invites you to Ocean City, MD from January 29-31, 1999 for our 14th annual environmental education conference.

The conference will offer hands-on workshops, optional field trips, exhibits, technical updates and so much more.

For a registration form contact Bernie Samm at (301)924-3123 or email to [bernie\\_samm@fc.mcps.klz.md.us](mailto:bernie_samm@fc.mcps.klz.md.us)

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