



Terrie Baumgardner (left) speaks with Shell Chemical environmental management representatives at a recent community meeting sponsored by the company in Vanport Township, Pennsylvania.



Community outreach 35 years after Bhopal

The disaster's legacy remains a work in progress at the interface of the chemical industry and the public

RICK MULLIN, C&EN NEW YORK CITY

Chemical Valley

I remember I was at home, fixing dinner for my family, when it came across the news on TV,” Pam Nixon recalls. “They mentioned Bhopal and a sister plant in Institute, West Virginia.” Nixon, living in Institute at the time, was aghast at news of thousands killed and many more injured by the release of methyl isocyanate (MIC) from a Union Carbide plant in a city in India she had never heard of.

But the letters MIC rang a bell. “I thought of the 18-wheelers I’d seen in front of my house going to the truck wash,” Nixon says. “I remember seeing on the side of the trucks the letters MIC. I never knew what it meant.”

They were letters that would, from that point, be laden with meaning for the residents of Institute, an unincorporated community named after the West Virginia Colored Institute, a historically black college that opened in 1891 and is now known as West Virginia State University.

Across the Kanawha River in Jefferson, West Virginia, Aaron Jones, chief of the volunteer fire department in 1984, the year of the Bhopal disaster, remembers it as a call to action. “It happened on Dec. 2,” he says. “By January, myself and the fire chief over in Institute were under intense pressure to do something about the fact that we had MIC right in our community. A chemical that killed thousands of people and injured a few hundred thousand.”

What were emergency responders expected to do? “Whatever we could do,” Jones says. “Which was nothing.” The operation of the MIC plant was entirely the purview of Union Carbide. It was clear, however, that the fire departments, local governments, and nearby communities required more infor-

In brief

Shell Chemical is 7 years into a community liaison program

for an ethylene cracker it began building a year and a half ago on the Ohio River near Pittsburgh. New to the region, with the first petrochemical plant accessing ethane from the Marcellus Shale natural gas reserve, Shell will be relying on community outreach know-how that the industry has garnered over decades. Some 200 mi (322 km) south, companies in the Kanawha Valley of West Virginia, host to scores of chemical operations since World War I, have confronted the challenge of opening up to communities and organizing outreach since the 1980s. Shocked into taking action by the deadly 1984 accident at a chemical plant in Bhopal, India—a sister facility to one in West Virginia—companies in the region became pioneers in a global industry-improvement program called Responsible Care. In the 35th anniversary year of the Bhopal explosion, C&EN traveled to Pennsylvania and West Virginia to assess the current state of community relations in the chemical industry.

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mation about what was made at the plant and the risk to people around it.

Warren Anderson, then CEO of Union Carbide, came to Institute soon after the Bhopal accident. “The company put a show on at the university,” Jones recalls. “They told everybody we were safe, we had nothing to worry about, that we had different standards here in the United States than they had over in Bhopal.” Jones was among the local residents whose skepticism was validated less than a year later, when an accidental release of aldicarb oxime and methylene chloride at the Institute plant sent at least 135 people, including Nixon, to the hospital.

Things never went back to normal, which is a good thing, according to Ann Green, who had worked as public relations director at the university in Institute. Life near the plant had been grimly fatalistic. “We used to have Carbide snow on our cars in the morning,” she remembers. “Some kind of fallout. It didn’t seem to hurt. It was just annoying.” The chemical plants were more than just a part of life, after all; they were the region’s economic livelihood.

Chemical production muscled in on salt mining in the region beginning in World War I, and it grew rapidly through World War II, creating something of a monoecconomy. Union Carbide built the first US ethylene cracker in Clendenin, West Virginia, in 1920. Blaine Island, just up river from the state capital of Charleston, was the site of Union Carbide’s first plant in the region. South Charleston, now with a large Dow facility, became known as the capital of Chemical Valley, home to a chain of companies, including DuPont, Monsanto, and FMC, clustered in smaller communities such as Institute, Nitro, and Belle along the Kanawha River.

By the 1980s the air smelled horrible, says Green, a native West Virginian. “The Nitro bridge was a pretty miserable place to drive over,” she recalls. “There was always something from the Monsanto plant. People used to say it was the smell of money.”

But Bhopal opened everybody’s eyes, Green says. “We no longer wanted to think of a polluted environment as normal.” And the idea of a plant in their midst manufacturing a chemical that killed thousands made safety a primary concern for local people. They wanted information from the companies operating in their neighborhood. “They wanted to know what things were,” she says. “They wanted to know more about operations.”

For their part, the companies recognized an immediate public relations challenge. Bhopal had woken up the world to the



Aaron Jones, former chief of the volunteer fire department in Jefferson, West Virginia, has been active in emergency response through a series of crises at the former Union Carbide plant across the river in Institute.

safety risks posed by chemical manufacturing, and Chemical Valley was on the front line. Pressure was building from state and federal regulators to reduce pollution, enhance safety, and report information about operations and risks.

The Bhopal shock also highlighted a divide in affected communities that complicated efforts to establish lines of communication. Green notes that many people in the Kanawha Valley, especially the thousands employed by the chemical industry, were satisfied with Anderson’s description of the safety of US operations. Others demanded answers to questions that hadn’t occurred to them before the accident in India. They wanted to know what was escaping into their communities and how it would affect their health.

And racial lines were drawn. “Ironically,” says Kathy Ferguson, who grew up in Institute, “it was a town of brown people in Bhopal.” Ferguson and others note that Institute is one of many black communities that live near US industrial fence lines and that bear the brunt of pollution. They face the greatest risk of impact from industrial accidents while reaping fewer of the economic benefits of proximity to industry, including employment, that are enjoyed by residents of predominantly white communities farther down the road.

Bhopal also changed the course of individual lives. In the years that followed, Nixon worked as community liaison for the West Virginia Department of Environmental Protection and headed People Concerned about MIC, which Ferguson’s

father, Warren, cofounded in the months after Bhopal.

Jones remained active with the fire department and regional emergency response efforts through a series of crises at the Institute plant, which changed hands three times after 1984. He became an active member of a community advisory panel established under an industry-sponsored program launched in response to the Bhopal accident.

And Green started her own consulting firm, rising as a key architect of community outreach under that program, known as Responsible Care.

Monaca, Pennsylvania

The hilltop ledge behind the Beaver Valley Mall in Monaca, Pennsylvania, about 30 mi (48 km) northwest of Pittsburgh, offers a panoramic view of green mountains, the Ohio River, and a large construction site. A cluster of tall red cranes surrounds a newly raised quenching tower and other structures where Shell Pennsylvania Chemicals, a division of Shell Chemical, is building an ethylene cracker and polyethylene production complex that is scheduled to come on line in 2021.

“See that tall one?” asks Michael Marr, external relations adviser for the division. “It’s the second-tallest crane in the world.” The plant will be the first modern petrochemical complex on the river.

It may not be the last. The Shell plant will be taking advantage of low-cost feedstock from the Marcellus Shale formation,

a region rich in natural gas and natural gas liquids that spreads through Ohio, Pennsylvania, West Virginia, and southern New York. Once considered trapped underground, the gas is being extracted through hydraulic fracturing, or fracking, a technique in which high-pressure injection of fluids into rock formations releases gas.

"I think it's going to have problems. But I feel that it is going to give us some jobs."

—Don Harris, retired plant worker, Beaver, Pennsylvania

Shell's pipeline division is working on the Falcon Ethane Pipeline System—97 mi (156 km) of pipeline running from Houston, Pennsylvania, to the cracker.

Shell expects the \$6 billion plant to produce 1.5 million metric tons (t) of ethylene and 1.6 million t of polyethylene a year. The company, Marr says, plans to market the small polymer beads to plastics fabricators within a 700 mi (1,126 km) radius of the plant—the largest market for plastics in North America, it says.

But the numbers that Marr emphasizes have to do with jobs—6,000 workers will be employed over the next 2 years to build the plant, and 600 will be employed full-time once it is running. Employment, Marr says, is an obvious concern in the once-thriving steel production hub. The region has endured decades of plant closures that impoverished working-class neighborhoods in towns such as Aliquippa, once home to the Jones and Laughlin Steel Company, the largest steel producer in the area.

Shell began communicating with communities early in 2012, at the beginning of a long process of gaining approvals and finalizing its decision to build on the site of Horsehead's shuttered zinc smelter in Potter Township, a community of 3,500 people next to Monaca. Courting the town council, the company flew two of the council's three members to Louisiana to give them a tour of its Geismar and Norco ethylene plants and a look at their impact on the local economy.

The company then broadened its outreach, scheduling a daylong introductory event at the Shadow Lakes Country Club in Aliquippa in 2014. Shell mailed invitations to 87,000 residents of Beaver County. About 1,200 people came to the reception, which some 30 Shell representatives attended.

"We took the opportunity to assess what people would want to hear more about," Marr says. The company placed fishbowls on tables for people to leave

notes stating their top concerns. "The two top issues were jobs and opportunities," he says. "Coming behind that was water and air emissions."

Shell followed up over the next year with information sessions on safety, water and wildlife, air emissions, and community impact. "We produced very detailed

11-by-17 trifold brochures so people could walk out with the air or water or safety story," Marr says. "That became much of the basis for our continued engagement until we reached a final investment decision in June of 2016."

Since then, Shell has focused on areas nearest the plant, such as Beaver, Vanport Township, and Potter Township, inviting

Manufacturing ethylene does not pose a risk to nearby communities comparable to an accidental MIC release. But the Shell cracker, operating on a river and expected to produce about 475 t of volatile organic compounds (VOCs) per year, will affect the environment and life in surrounding towns.

Marr says Shell has been telling people at its community meetings that the cracker is well within federally regulated VOC emission parameters. He says the company is allowed to purchase emission reduction credits from sources across the Northeast, but it made a point of buying from local industry. Water pollution, he tells community members, will be negligible compared with the impact of the zinc smelter formerly at the site. He describes elaborate remediation work done by Shell, an \$80 million project.

The community's reception has been mixed. Most locals at the Towne Square Restaurant in Beaver on a recent Friday morning are cautiously optimistic at best



Michael Marr, external relations adviser for Shell Pennsylvania Chemicals, is coordinating community relations for the first modern petrochemical project on the Ohio River.

residents to meetings where managers from the plant give updates on construction, job prospects, and environmental impact. After the presentations, Shell staff is available to answer questions at information tables dispersed around the room.

Last year, Shell donated \$1 million to the Community College of Beaver County to establish a process technology training center.

about life with Shell. "We need work. That's the way I look at it," says Don Harris, a retiree who worked at the zinc smelter in the 1990s. "I think it's going to have problems. But I feel that it is going to give us some jobs."

Leslie Sugar, a waitress who moved to Beaver earlier this year, is more focused on likely problems. "It might provide jobs, but it's not good for the environment."

She laments the rise in rents that hit the town with the wave of construction workers in the past year.

Her coworker Ashley Trevelline is even less enthusiastic. “Not a big fan of it because of its impact on the environment. There will be a lot of problems, and I don’t think it will bring us as many jobs as they say it will long term,” says Trevelline, who lives 10 mi (16 km) away in Chippewa Township. Others in town question how many of the 600 people Shell promises to employ will come from local communities, given the level of technical expertise required for plant operators.

Regis McLaughlin, chatting with his wife by their sidewalk garden around the block, is more emphatically pro-Shell. “Best thing that ever happened to Beaver County,” he says. “Jobs and help for the economy.”

Shell’s outreach program has Beaver covered, but the company is not hosting community meetings as far afield as, say, Chippewa. Yet critics of the plant say it will affect communities 100 mi (161 km) or more from the cracker. Air pollution will affect the city of Pittsburgh and beyond, they say. And the uptick in fracking, with its ever-sprawling infrastructure for moving liquid natural gas that contains ethane for the plant, will pollute the air and water across all western Pennsylvania, they contend. They point to two pipeline explosions in the region, one in Aliquippa, in recent months.

“Word on the street is they’re going to need 1,000 new fracking wells to feed that cracker,” says Thaddeus Popovich, a retired engineer who has worked for Westinghouse Electric and Corning. He notes that wells have a short operational life span and will constantly need replacing. And more petrochemical development may follow. He mentions that PTT Global Chemical, a Thai company, plans to begin building a cracker in Belmont County, Ohio, not far down the river.

Popovich got the 1,000-well figure from John Stolz, director of the Center for Environmental Research and Education at Duquesne University. Stolz is among the academics and analysts who have spoken about the Shell plant at meetings convened by community groups. Popovich, an outspoken critic of the plant, is a member of several such groups, including the Beaver County Marcellus Awareness Committee (BCMAC) and Allegheny County Clean Air Now. Both are affiliates of the Breathe Project, a collective of 34 environmental groups and agencies, including the American Lung Association.

The Breathe Project hosted a gathering of interested community members in



Warren Ferguson, founder of People Concerned about MIC, with his daughter, Kathy, current president of the town council in Institute, West Virginia, in a family photograph

2016. Popovich says the event, titled “A Petrochemical Plant for Our Neighbor? The Rest of the Story,” might be viewed as a pendant to Shell’s welcome program at the country club.

He notes that the Breathe Project arranged to have residents of Norco, a black community at the fence line of the Shell refinery and petrochemical complex, on hand to talk about the impact of an ethylene cracker on their lives and to take questions.

Popovich, who lives in Franklin Park in Allegheny County, says he attended Shell’s welcome meeting as well as several of the local meetings that followed it. He was put off by the presence of uniformed security at the country club, he says, and is critical of the “information table” approach to taking questions at a public forum.

“Coming out of the corporate world, I admire their strategy,” he quips. “They made it look like they were communicating with the communities, but they held us in silos. So nobody could really hear anybody else. At no time did they allow a discussion from the audience. Brilliant strategy.”

Institute, West Virginia

Kathy Ferguson remembers her father’s response to Bhopal. Offered the opportunity to run an academic support program at West Virginia State some years before the

disaster, Warren Ferguson moved his family from New York City to his hometown of Institute. After the news from Bhopal, she says, he turned his attention to organizing community interaction with Union Carbide. He recruited Edwin Hoffman, a sociology professor at the college, and the two formed People Concerned about MIC.

The group convened meetings of Institute residents, inviting industry officials. Union Carbide managers sometimes came, and they got an earful as community members complained of smells and health problems. These meetings marked the first organized exchange between industry and communities in the Kanawha Valley—and likely anywhere in the US.

Across the river in Saint Albans, West Virginia, Maya Nye was only 7 years old when the news broke of the Bhopal disaster. Her recollection of the aftermath is vague, but she has vivid memories of a second post-Bhopal accident at the Institute plant, a 1993 explosion that killed two workers at a unit where Rhône-Poulenc, which acquired the facility from Union Carbide in 1986, manufactured its thiodicarb-based Larvin insecticide.

Nye, whose father worked for a Union Carbide technology center in South Charleston, was at home alone when it happened. “There was a fire truck going down my street the wrong way with a loudspeaker saying there was a shelter in

place in effect,” she recalls. “At some point there was an alarm going off at the plant, and I remember calling my dad, panicked. I knew what the alarm meant.”

The phone lines were jammed, and she couldn’t reach her father. She began taping windows and doors as she’d been taught to do. “I remember being extremely frightened and getting a wet wash cloth and putting it over my face because I could smell the chemicals coming in my house,” she says.

Nye, who became a community activist, went to Antioch College, where for her senior project she wrote a play called *The Smell of Money*. She returned to the Kanawha Valley to head People Concerned about MIC after a third post-Bhopal accident at the plant in 2008.

Jones, the volunteer fire chief in Jefferson, remembers all three incidents in detail. Over breakfast at Tudor’s Biscuit World in South Charleston, he shakes his head in amazement at the 2008 emergency—an explosion at the Larvin unit, by then owned by Bayer, that also killed two workers, nearly causing a release of MIC stored nearby.

“It was a fiasco because the Kanawha County emergency services could not get through to talk to anybody who knew what was going on,” he says. Emergency services placed repeated calls to the plant but could reach only a guard at the front gate. “And the guard didn’t know anything,” Jones says.

Nor did area emergency responders know whether they needed to issue a shelter-in-place advisory or an evacuation order. They issued the shelter in place as a precaution.

The explosion, attributed to various mishaps, including a lack of operator training on a new control system, could have resulted in many more deaths, Jones says. “There was MIC stored close by. When the tank blew up, it went this way,” says Jones, pointing right. “If it went that way,” he says, pointing left, “it would have hit the MIC tank and blown it up.”

The accident led to a congressional investigation, a flurry of lawsuits, and in 2015, a \$5.6 million settlement with the US Department of Justice and US Environmental Protection Agency. It brought to

a crisis the fraught relationship between People Concerned about MIC and Bayer. And in the minds of those who remembered the Responsible Care program, it cast doubts about the effectiveness of the chemical industry’s community outreach.

Responsible Care was created by the Chemistry Industry Association of Canada in 1985 and later adopted by industry associations in the US, Europe, and Asia. Compliance with its codes, covering safety, supply chain management, transportation, and community outreach, has been a requirement for membership in the American Chemistry Council (ACC), the main US industry association, since the late 1980s.

Invoked by chemical industry executives speaking on nearly any topic at any event through much of the 1990s, the program is credited with performance enhancement, verified by third-party auditors, in all the code areas. If the name Responsible Care is rarely heard today, ACC executives say,

it’s because the program has been internalized and become part of the culture in the global chemical industry.

Green advised an industry-sponsored community advisory panel in Institute in the 1980s and went on to consult with many chemical companies on launching such panels to help meet the Responsible Care community outreach code. When the ACC returned a call to C&EN to give an update on Responsible Care this year, Green was on the line.

Green says the ACC’s program quickly spread an ethic of community

outreach via peer pressure as well as peer support.

“Responsible Care literally codified that whole process so that everybody got on board,” she says. “If you run a plant, and you’re sharing all your information with your community, you’d want every other plant to do the same thing.” From a public relations standpoint, Responsible Care was a gem. “I thought it was terrific,” she says. “It was the industry telling the industry what to do.”

Today, Ann Green Communications works with individual companies to develop programs catered to plant operations and community needs. “Occasionally we are called in to straighten things out,” Green says. “We believe very strongly in a

“The chemical companies helped to create and fortify a middle class in the area. I advocate for my community as best I can.”

—Kathy Ferguson, president, Sub-Area Planning Committee, Institute, West Virginia

Milestones in community outreach

The long history of community liaisons in the Kanawha Valley, and a new page near Pittsburgh.

- **1865** Samuel I. Cabell, a West Virginia pioneer, is murdered. He left the land that is now Institute, West Virginia, to his slave Mary Barnes and their 13 children.
- **1915** Chemical companies arrive in West Virginia, attracted by salt, coal, and gas. Belle Alkali, among the first, sets up near Belle, producing chlor-alkali by brine electrolysis.
- **1984** A release of methyl isocyanate at a Union Carbide insecticide factory in Bhopal, India, kills at least 3,000 and injures over 200,000. Union Carbide also manufactures the chemical in Institute.
- **1985** An accidental release of aldicarb oxime and methylene chloride at Union Carbide’s plant in Institute sends at least 135 people to the hospital.
- **1986** Rhône-Poulenc buys the Institute plant.
- **1988** The American Chemistry Council adopts Responsible Care, requiring members to subscribe to its codes, including one for community outreach. Community advisory panels proliferate.
- **1993** An explosion at Rhône-Poulenc’s insecticide plant in Institute kills two workers. A shelter-in-place warning is issued for nearby towns, including Institute and Saint Albans.
- **2002** Bayer acquires the Institute plant.
- **2008** An explosion at the insecticide plant again kills two workers. A breakdown in communications cuts off local authorities and emergency responders from information from the plant. A precautionary shelter-in-place warning is declared.
- **2011** Bayer announces it will discontinue manufacturing, storing, and transporting methyl isocyanate in Institute.
- **2012** Shell initiates public outreach for its proposed ethylene cracker on the Ohio River near Pittsburgh.
- **2015** Dow Chemical buys the Institute plant.
- **2017** Shell begins construction of its cracker in Potter Township, Pennsylvania. A series of community meetings takes place in several towns adjacent to the plant, including Beaver and Vanport Township.
- **2017** US Methanol begins constructing its first plant, which will access feedstock from the Marcellus Shale reserve, on a site leased from Dow in Institute.

group that matches the fabric of the community, represents all stakeholders, and is well rounded.”

Crafting a community advisory panel to fit the industrial sprawl and disparate communities of the Kanawha Valley proved a challenge. Eventually, two panels emerged: the Western Kanawha Valley panel, which included the Union Carbide plant, and the South Charleston panel, with Dow as the anchor. The Kanawha Valley was a laboratory for developing community advisory panel agendas, Green says. “This valley was the test case for risk management planning at the EPA. We got ahead of all that because this is where the chemical industry got started.”

The 2008 explosion, however, exposed a serious disconnect between Bayer and the community it most needed to communicate with. Among the documents that emerged in the congressional investigation of Bayer’s interaction with the US Chemical Safety Board was a draft community relations strategy for Bayer, written by Green and dated Dec. 29, 2008.

“The old ‘People Concerned About MIC’ activist group, established in the aftermath of Bhopal, has been reactivated

with an ominous new leader, Maya Nye,” the memo reads in a fifth bullet item. Nye, it says, “appears to have animosity towards the chemical industry,” promising to bring “outside agitators” to bear on efforts to get the company to remove MIC and phosgene, a dangerous chemical used in the manufacture of MIC, from the site.

“Our goal with People Concerned About MIC should be to marginalize them,” the memo continues. “Take a similar approach to The Charleston Gazette.”

“It was never meant to be a final document,” Green now says. “Those were some initial thoughts, probably based on my irritation that I couldn’t get anybody to talk to me.” Green claims she had a constructive relationship with previous directors of the group, including Nixon, but had failed in efforts to meet with Nye.

“I regret that that document became public,” she says. “In fact, it died on the vine because we had conversations and decided it wasn’t appropriate.”

Among the lawsuits that followed the 2008 accident was *Nye v. Bayer Crop-Science*, filed in 2011, in which Nye and 16 others, including Warren Ferguson and several residents of Institute, sued to prevent Bayer from restarting MIC production at the plant. The company announced the Friday before the Monday the case would have gone to trial that it would discontinue production, storage, and transportation of MIC, effectively ending the suit.

William V. DePaulo, the lawyer who represented the Institute group, says Exhibit A was a map created from information that Bayer filed with the EPA. It showed the area likely affected by an MIC release from the Institute plant as a circle with a 25 mi (40 km) radius representing a population of about 300,000, including the city of Charleston. A Bhopal survivor was also set to testify at the trial.

DePaulo says the draft strategy memo and lawsuit mark the beginning of a new era in community relations. “You’ve got a BC and an AD in this lawsuit,” he says. “BC was typified by that memo—marginalize the movement. I feel like after that there has probably been an improvement.”

Donna Willis, a lifelong resident of Institute and plaintiff in Nye’s suit against Bayer, does not recognize an AD. Willis is among a group of residents who remain persistently vocal critics of the industry, ultimately distrustful of any effort by chemical companies to reach out to communities. She cites the persistence of pollution, constant chemical odors, and unmitigated health problems and deaths that she and others attribute to Institute’s proximity to manufacturing.

Willis says she has not seen a fundamental change in responsiveness on the part of industry, and she feels the voices in her community are routinely pushed aside. She dismisses the community advisory panels out of hand. However, Kathy Ferguson, who was recently elected president of the Sub-Area Planning Committee, effectively the town council of Institute, has started to attend the Western Kanawha Valley panel meetings.

Ferguson, like Willis, is critical of the industry’s communications efforts in Institute and concerned about health impacts. Her family sued Bayer, contending that her mother’s death in 2008 was a result of chemical exposure from the explosion, but the case was filed after the statute of limitations.

Still, she’s determined to get involved on the panel and recognizes the industry’s importance to the region. “The chemical companies helped to create and fortify a middle class in the area,” she says. “I advocate for my community as best I can.”

Vanport and Aliquippa, Pennsylvania

It’s a cool, clear June evening in Vanport, Pennsylvania, a small community on the Ohio River. The trees along Jefferson Avenue cast shadows across the playground next to the volunteer fire department. Across the street, Margie Thompson and Kevin Ordway are sitting on the front steps of Ordway’s house. Tina Ceratti crosses over from the playground, where her young son is playing. “Are you going tonight?” she asks. “We think so,” Thompson answers.

Shell’s community meeting begins at the firehouse in 15 min. The three, who were mailed flyers about the meeting, are curious. It will be their first contact with the company regarding the plant under construction a mile down and on the other side of the river.

“All I’ve seen since they’ve been here is what I’ve read in the papers and seen on the news,” Ordway says. The others nod. “But we’re on the other side of the river,”

Union Carbide’s former plant in Institute, West Virginia, viewed from across the river in Jefferson



he continues. “So no matter what we do or say, it doesn’t really matter. We have no power to do anything.”

“I don’t even know what questions to ask,” Ceratti says. “I just want to listen.” Her concerns? “Well, toxicity, obviously,” she says. “I’m a renter. And if I ever get a proposal to buy that house, I would want to know if it’s a safe decision for me.”

“I think it’s going to smell,” Thompson says. “It’s going to smell bad over here a lot.”

About 30 people show up to the meeting, chatting in small groups before the presentation begins. Many say they are there mainly to listen. A prominent concern is health impact. Few have had any contact with the company, though Maureen Bostwick, a secretary at the local government office, says Shell has been in regular touch with Vanport officials.

Sitting with an elaborately carved walking stick, Scott Kent, an 89-year-old resident of the town, is skeptical of its future with a petrochemical plant nearby. “I’m wondering if this will be another Cancer Alley like the one they have in Louisiana,” he says, referring to the stretch of the Mississippi between Baton Rouge and New Orleans where high rates of cancer are attributed to heavy refinery and petrochemical activity. “Shell might just be the seed” for further development on the river, Kent says. “I’m going to listen.”

The meeting begins with Marr instructing the audience on where to find exit doors and where to muster outside the building in case of an emergency. Project manager and future plant manager Jeff Krafve leads off with a slideshow on Shell-sponsored projects in the community, including the building of a playground and the River Sweep program, an effort to clean the shores of the river in town.

The slideshow continues with construction manager John Owoyemi updating progress at the site, showing at one point



Scott Kent, of Vanport, wonders whether Shell is just the first participant in a coming petrochemical buildout on the Ohio River near Pittsburgh.

“All I’ve seen since they’ve been here is what I’ve read in the papers and seen on the news.”

—Kevin Ordway, resident of Vanport Township, Pennsylvania

a photo of “the mother of all cranes,” the tall one Marr had pointed to. He speaks of the jobs Shell expects to create. David Conti, community liaison officer for Shell’s pipeline division, describes construction progress and operational safety of the pipeline that will supply ethane to the cracker. Colleagues representing environmental management and product marketing also speak.

A lavishly produced film about the project, featuring the raising of the monolithic quenching tower, an early milestone, closes the presentations, after which speakers take their positions at tables along two walls of the large meeting room to field questions.

Individuals and groups of two to four people gather at the tables to engage with Shell staff. They move from table to table. Conti defers to corporate public relations when asked a question about the Falcon pipeline by C&EN; a phone interview is arranged.

Terrie Baumgardner, a retired college English and communications instructor who had worked at a nearby satellite of Pennsylvania State University, says she knew what to expect when she came to the meeting—she had attended similar events in Potter Township, Beaver, and Aliquippa.

“They are all in the same mold. It’s a cliché, but they’re kind of a dog-and-pony show. It’s glitzy, self-congratulatory. There is no dialogue,” she says. “People with comments are relegated to corner tables either in the room or out of the room and instructed to ask the questions one on one to experts. That is not community. It’s not a listening event.”

Baumgardner visits several tables. She says she asked at the pipeline table why the section of the Falcon near the Ambridge Reservoir is being laid via trenching rather than horizontal directional drilling, which she had read was preferable near a water source. She was told it was an engineering decision. She asked when dig-

ging by the reservoir would start, she says. “He answered that it’s finished.”

Baumgardner is up front about her opposition to fracking, the pipeline, and the cracker. She’s affiliated with several organizations, including BCMAC, the Clean Air Council, and the Breathe Project. “We get a lot of information from those channels,” she says.

Baumgardner and several other members of organizations opposed to development met with C&EN at the library in Aliquippa the day after the Vanport event to discuss their outreach efforts.

Lois Bjornson, active in various groups, including the Clean Air Council, sees herself as a lone agent most of the time, frequently meeting with local town councils. “I came into this out of necessity,” says Bjornson, a mother of four living in Scenery Hill, a Washington County town about an hour’s drive from Aliquippa. “I’m an impacted resident.”

Bjornson grew up in the area and moved to Scenery Hill 15 years ago. “This area was once impacted by coal and now with fracking,” she says. “Big, thriving towns have become environmental justice communities. I just go in and help them to hopefully write better protective ordinances.”

She dismisses the suggestion that she lives beyond the community that Shell needs to reach in its liaison efforts. At this point, Bjornson says, fracking all over western Pennsylvania will be providing feedstock for the Shell cracker. “The industry confuses people,” she says. “A lot of people don’t connect fracking with Shell because it is packaged as energy independence.”

Washington County, where Bjornson lives, is the most heavily fracked region of the state, she says. “When fracking came in, people thought it would be the holy grail,” she says. “Then bad things started happening.” There is growing opposition, she says, in response to years of heavy machinery and pollution that have affected the air and water as well as farming. The gas-extraction companies continue to promote economic benefit without communicating the risks, she says.

Closer to the cracker, Robert Schmetzer, council president and former mayor of South Heights, a small town in Beaver County, is also a community organizer critical of pipeline and petrochemical development in western Pennsylvania.

Schmetzer, who is president of BCMAC, says he’s met with Shell management several times. “I’ve invited them to municipal meetings to give us a breakdown of what they are going to do,” he says. “Basically they keep it simple—they will be making little plastic beads called nurdles.”

Shell has encouraged citizens to come forward with concerns, Schmetzer says, and he’s done so. “I have a green book I got from the Clean Air Council with data on pollution that will come out of this plant,” he said. He read Shell representatives the data on VOCs and hazardous air pollutants. “The response was silence,” Schmetzer says. “They are excellent at silence. And there was no follow-up. They know who I am. I’m president of the borough council.”

Perhaps not for long, he says, as he is considering leaving the area. “What kind of place will this be?” he asks, imagining the impact of continued petrochemical development on the Ohio River. Popovich, who attended the library meeting, says the thought of leaving has crossed his mind. Baumgardner says the same.

Cross Lanes, West Virginia

The Western Kanawha Valley Community Advisory Panel meeting is about to begin. The long tables at the Red Cross center in Cross Lanes, a small town near South Charleston, are arranged in a large square with about 30 name cards for assigned seating around its perimeter. A



Mary Green (center) facilitated a recent meeting of the Western Kanawha Valley Community Advisory Panel, which includes three chemical companies operating on the site of the former Union Carbide plant in Institute, West Virginia.

lunch buffet is set at the back of the room, and a small table to the side has name cards for a journalist and an Ann Green Communications associate.

Panel members file in, grab lunch, and socialize. In the corner, four high school students are chatting. Many of the people around the room appear by their accoutrements to be local emergency responders—some are uniformed police officers. It is a predominantly white gathering, whereas Institute, where many companies on the panel operate, is a black community.

Mary Green of Ann Green Communications, Ann’s daughter-in-law, calls the meeting to order.

The first agenda item is a round of reports from chemical companies, fire departments, and police departments giving brief updates on activities. No serious incidents or accidents are mentioned. One US Occupational Safety and Health Administration citation for failure to wear protective eyewear is reported. The rest of the meeting is given to presentations on educational programs, with the students’ talk about education options after high school as the main agenda item.

The only community members in attendance are official representatives of chemical companies, emergency response organizations, schools, or local governments who happen to live near the plant. Jones, now on the board of the Jefferson fire department, is one of them. Kenneth Mosley, who is on the board of the Institute fire department, a deacon at the

Ferguson Memorial Baptist Church, and the vice president of Institute’s Sub-Area Planning Committee, is another. Kathy Ferguson, the president of that committee, does not attend, explaining later that she was traveling.

During a question period at the end of the meeting, only Jones speaks up, asking about loud unintelligible announcements broadcast late on weekend nights from a plant’s emergency loudspeaker system. C. W. Sigman, county emergency management director, answers that it is likely a lightning prediction warning active from 6:00 a.m. to 11:00 p.m.

The meeting lasts about an hour and a half.

A visitor might well be impressed with the group’s engagement on issues of importance. Education and workforce development, vital topics in any community, are critical in West Virginia. Facilitation is efficient; speakers come prepared. The panel itself comes across as a collegial gathering with deep roots in nearby communities. State senator Glenn D. Jeffries is a panel member. Information is given freely. Nothing close to the confrontational encounters between industry and residents of the late 1980s seems possible.

“What you saw was a result of community and industry diligently working to form an open dialogue and a relationship,” Mary Green says. Members are encouraged to bring community concerns to the panel, she says. “This is not a wallflower group. There will be pointed and direct

questions,” says Green, who has consulted on and facilitated community advisory panels across the country. While elsewhere she has had to call 5 min time-outs when things got heated, she says the Western Kanawha Valley meetings have never been marked by confrontation.

The panel’s industry participants currently include Dow, DuPont, and US Methanol, all operating on the original Union Carbide site, now owned by Dow; AC&S, a construction chemical firm in Nitro; REO Logistics; and Total Distribution.

Marianne McClure, the plant manager at DuPont’s site, has attended only a few meetings—the company joined just this year after Dow’s glutaraldehyde operation became part of DuPont. “As Dow, we had a strong local presence and site administration that maintained community connections,” McClure says. “Now that we’ve transitioned to DuPont, we’ve lost some of that, so we’re trying to establish ourselves in the community.”

Another newcomer, US Methanol, has more to talk about. The company purchased an idle 200,000 t per year methanol facility in Brazil and recently moved it to land leased from Dow in Institute. Angi Hyre, controller at the 3-year-old company, gave a rundown on reconstruction of the plant, called Liberty One, which is due on line by the end of next year. She will be replaced as company representative on the panel by a newly hired plant manager.

David Casebolt, the mayor of Nitro, is satisfied with industry-community relations. “The community advisory panel has been very beneficial to the city of Nitro,” he says, noting that industry members have helped fund a biotech lab at the high school. Casebolt, a lifelong resident of Nitro and former Union Carbide employee—he was a lab technician in Institute for 28 years—concedes that few independent community members are on the panel. “But a lot of representatives are citizens in the community,” he says. “I’m there, my fire chief’s there. But I get very few concerns from the citizens of Nitro about those plants.”

The residents of Institute have concerns. But other than Mosley, they are not at the members- and guests-only

panel meeting that afternoon. A chemist by training who worked at Union Carbide’s Sissonville plant near Charleston, Mosley has been critical of some of industry’s most vocal opponents, including People Concerned about MIC. “The community and production have to coexist,” he says.

Mosley says his background as a chemist provides him an understanding of the operations at the Institute plant. “You have to put the big picture together,” he says.

He feels the Western Kanawha Valley panel is effectively taking on topics of importance to the community. The challenge, he says, is in getting the information from the meetings back to the community.

Jones is no industry critic, but he’s cooler on the panel. He has been attending meetings since 2005.

“I’m not one of these people wanting to get rid of the chemical companies,” he says, standing across the river from the largely depleted Institute plant the day after the meeting in Cross Lanes. “I would like to see that place covered with chemical units. I have grandchildren who may never work there, but they may have spin-off jobs.” He

is, however, a stickler for things being done correctly. The Western Kanawha Valley Community Advisory Panel, he says, has strayed from its focus on plant operations and communicating with the public.

“As a community advisory member, they don’t give you that much information,” he says, adding that he was dissatisfied with the answer to his question about the late-night loudspeaker at the meeting and still doesn’t know what its noise is all about. “And to be honest with you, a lot of the people on that committee are not there for questions about what’s going on in the plant. They seem to be interested in other things.”

Houston, Pennsylvania

Leann Leiter, a field researcher and community advocate with Earthworks, a nonprofit that works with communities on environmental issues, pulls up a map on her laptop in the parking lot of Shelley’s Pike Inn, a diner in Houston, Pennsylvania. She provides an overview of some of the pipeline, fracking, and gas-processing operations in western Pennsylvania on a tour she will lead.

The map, with black points indicating wells, compressor stations, and gas-processing plants, glows from halos around each point indicating an estimated range of potential health threats from exposure to well and plant operations. Together, they make the laptop screen a field of yellow-green light.

“You may have compressor stations every 15 mi (24 km) along a given pipeline,” she says. “There can be two or more compressors in a square mile or less because there are so many different pipelines crisscrossing the area.” There are 88,000 mi (141,622 km) of pipeline in the region, Leiter says, quoting a statistic from the Pipeline and Hazardous Materials Safety Administration, a division of the US Department of Transportation. The map shows about 12,000 fracking wells.

Leiter references a count by the FracTracker Alliance, a nonprofit group that gathers data on fracking, of 70 fires or explosions associated with the natural gas infrastructure in western Pennsylvania over the past 8 years. Her tour begins where the Falcon Pipeline be-



Leann Leiter, a field researcher and community advocate with Earthworks, monitors pipeline activity and meets with local municipalities in western Pennsylvania to discuss environmental and safety risks associated with fracking and the gas infrastructure for the Shell cracker.

gins, the MarkWest Energy Partners cryogenic processing plant in Houston, which is also the site of a recent fire.

The country roads on the tour wind through scenic farmland. At several corners, signs placed by gas or pipeline companies advise their drivers not to enter with heavy vehicles. A lawn sign reads, "Drill a well, bring a soldier home." After a couple of hours driving past hillsides with green compressor stations and other signs of infrastructure, Leiter pulls up to a farm said to have the most silos of any in the state. A huge gas compressor sits on its highest hill.

Leiter says Earthworks arranges to meet with local governments and community members in the region. Earlier this year, she accompanied Bjornson of the Clean Air Council and Edward Ketyer of the Southwest Pennsylvania Environmental Health Project to meetings in Marianna Borough in southern Washington County.

"They don't have oil and gas development currently. But they're kind of surrounded by it and deciding whether they want it," she says. "So they invited us." Two meetings were arranged, one with the borough supervisors and one for the community at large. Community members attended both, she says. "We informed them on health hazards and the disaster potential as they decide whether they want to write an ordinance to protect the community from development or whether they want to welcome it."

Opinions among the supervisors and in the community are divided, Leiter says.

Others concerned about industrial development are making connections with communities in the field. John Detwiler, a former construction project manager who later worked as a financial and strategy consultant with IBM, has given talks hosted by groups including BCMAC on what he views

"Southwest Pennsylvania is becoming one big chemical plant."

—Clifford Lau, chemistry professor

as the unsustainable economics of fracking and petrochemical industry development on the Ohio River.

Methane, the main component of natural gas, is not as profitable as it had been for gas producers in the heavily fracked region, he says. Growth lies in extracting ethane to serve plants like the Shell cracker, which will accelerate fracking. Excess US capacity will require manufacturers to export plastics, he adds.

Detwiler mentions the proposed Appalachian Storage and Trading Hub, an ambitious scheme to invest in infrastructure that would allow a local petrochemical industry to grow out of the Marcellus Shale reserves. The ACC estimates that a \$10 billion hub would attract \$36 billion in chemical production and generate 100,000 jobs. The project currently has one China-based financial backer and last year won preliminary support from the federal government.

Clifford Lau, a chemist who has

worked in local industry and taught chemistry at Duquesne, is also speaking to groups in the region. The inspiration for a lecture series on the prospect of petrochemical development in western Pennsylvania hit him as he left a state Department of Environmental Protection

(DEP) hearing on the Falcon pipeline in rural Washington County.

"We left late at night, and it was dark," he recalls. "I looked out, and I could see all the light from the processing plants and fracking wells and flares. It struck me that even 10 years ago, I would have looked out and seen complete darkness."

Lau says he wants to alert residents of rural Pennsylvania, in farm country far from the Shell cracker, that they are already living in impacted communities. "As a chemist, I have been in a lot of chemical production sites where the plant has a place for receiving raw materials, for processing raw materials, and changing the raw materials into a product," he says.

Traditionally, that has all been contained within a couple of square miles even at a large complex. But the gas-processing infrastructure has pushed the risks associated with plants far past factory gates, he says. "Southwest Pennsylvania is becoming one big chemical plant."

Leiter, Detwiler, and Lau claim there is no discernible industry outreach in areas under pipeline development other than dealmaking with property owners. Shell, however, says it launched a community liaison program years before beginning work on the Falcon pipeline.

"The Falcon pipeline began construction this year," says Virginia Q. Sanchez, external relations adviser for Shell Pipeline. "We began engaging with the community more than 4 years ago." The company surveyed over 200 mi (322 km) for the 97 mi (156 km) project, garnering contractual arrangements with about 300 landowners.

"We chose not to pursue eminent domain," Sanchez says. "We negotiated with every landowner, the majority being private landowners, farm owners, families." The pipeline takes some unusual turns as it snakes to avoid property that owners would not sign over.

Over the past year, "the critical year, the permitting year," the company has met with local governments and school



**MarkWest
Energy Partners'
Harmon Creek
Processing Plant
in Smith Township,
Pennsylvania**

districts to discuss traffic, safety, and work schedules, Sanchez says. Most of the contact with the community is standard procedure for the pipeline division, but the Falcon project called for extra measures, according to Sanchez. Moving into a region where it hasn't done a major project in many years, Shell placed a community liaison officer to field concerns from local governments and community members. It hosted two community meetings similar to the Shell Pennsylvania Chemicals events, Sanchez says.

The first of three public hearings on the pipeline sponsored by the state DEP took place last month at Central Valley High School in Monaca. The question of acceptable risk made for a more contentious discussion than took place at the pipeline division's community meetings, according to the *Pittsburgh Post-Gazette*. A parade of citizens from Beaver County and farther afield contended that risk to health and safety outweighed the economic benefit of increased fracking and the pipeline's transportation of ethane for the Shell cracker.

According to Detwiler, public awareness of the risks posed by the pipeline and fracking is growing in Pennsylvania. But so is the next wave of fracking. "Now you see more and more municipalities trying to keep fracking out, and the industry going to the courts to say that the municipality is not allowed to keep fracking out," he says. "The big, scary thing coming over the hill is the petrochemical build-out and all the momentum that's being put behind it."

Indeed, President Donald J. Trump has shown interest. The president planned a trip to Potter Township to tour the Shell cracker last week but canceled following the shootings that took place in Texas and Ohio the previous weekend.

Some momentum is building in the Kanawha Valley as well. Investors are exploring building ethylene crackers at underused chemical industry sites. And US Methanol has plans for a Liberty Two in Institute. The company recently purchased another shuttered methanol plant, this one in Slovenia, that it hopes to transplant to West Virginia.

Beaver, Pennsylvania

It's a sunny Saturday for Garrison Day in Beaver, and the town is out in full force. The three-block town square is filled with booths selling crafts and fine arts. Aisles of food stands offer local cuisine and more exotic fare.

BCMAC has a booth with information on environmental and health impacts of the Shell cracker. The Vanport Township



Gary Grimm (back right), superintendent of the Vanport water plant, was on hand to discuss summertime water conservation at Beaver, Pennsylvania's Garrison Day in June.

Municipal Authority is there with a model of the town's water table in an aquarium. Gary Grimm, superintendent of the Vanport water plant, is talking to walk-ups about summertime water conservation. There is no information at the municipal authority's booth about the impact of the cracker on the water supply.

Although Garrison Day is the largest local gathering of the year, drawing a crowd from towns throughout the area, Shell, which recently held its community meeting in nearby Vanport, has no presence. Traffic seems light at the BCMAC booth. It's hard to compete with hand-thrown pottery, Amish doughnuts, and artisan jewelry at the many stands on the square.

Overall, the rise of a major petrochemical plant seems to be causing little alarm in a region whose history is steeped in heavy industry. The Kanawha Valley is a similar, more hardscrabble landscape, where communities are likely to welcome an industrial newcomer like US Methanol.

The cordial, if anodyne, Western Kanawha Valley Community Advisory Panel meeting, focused on education and workforce development, arguably speaks to the success of the Responsible Care program in connecting the chemical industry with communities on key concerns. But it also shows how the program has evolved away from a focus on information exchange between chemical plants and the communities, such as Institute, at their fence lines.

Jenny Heumann Godes, director of product safety and stakeholder communications at the ACC, says the Responsible

Care program continues to evolve. The association is merging it with a new sustainability regimen for association members. Progress was discussed at the ACC's annual Responsible Care conference in March, an event that is closed to the press.

But Garrison Day is wide open. "Will you be here on Tuesday?" Baumgardner asks at the BCMAC booth. "John Detwiler is speaking about the economics of fracking at the First Presbyterian Church."

An email arrives the following week from Thompson, who lives across the street from the firehouse in Vanport. Thompson, whom Shell would likely find more persuadable than Baumgardner, shares her takeaway from the recent Shell meeting at the firehouse.

"For me, the presentation was interesting, although a bit shallow. I had learned more about it from an article in the *Beaver County Times* a month or so earlier," Thompson writes. She also expresses disappointment in the low turnout of people from her neighborhood.

"Given that low attendance, I thought it would've been more helpful if they had altered their plan of the individual tables for questions and instead would have brought their people up front and let the small audience ask their questions. That way we might have heard information that we didn't even think about asking. But all in all, I appreciate what they did."

Thompson says she remains concerned about the possibility of air pollution from the plant. "We'll just wait and see and keep our fingers crossed," she says. ■

More online

For a look at educational outreach efforts by chemical makers in Pennsylvania and West Virginia, visit cenm.ag/industryoutreach.