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Educating the Educators:
Pipeline Procedure and Safety Education Program (PPSEP)
Agreement No.: DTPH56-11-G-PHPT22

Pursuant to the contracted agreement between the US Department of Transportation, Pipeline Hazardous Materials Safety Administration (PHMSA) and Pipeline Safety Coalition (PSC) and in compliance with Article III, Expected Program Outputs, Pipeline Safety Coalition submits this final report demonstrating completion of the research, definition, creation and delivery of a curriculum for training educators; to be used initially in Pennsylvania and to be transferable to other states.

In compliance with Article X. Reports: Section 10.01 Final Report, PSC hereby delivers this letter-type final report to the GOTR and the AA and includes Section 10.02 Federal Financial Report, Standard Form 425 (SF-425).

Respectfully Submitted,

Lynda Farrell
Pipeline Safety Coalition

Pipeline Safety Coalition
Final Report

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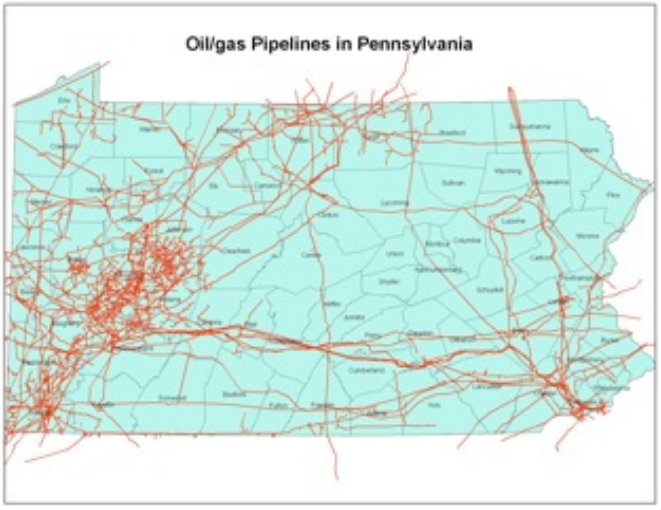
Introduction & Background:
Risk management through education was the foundation the Project. Addressing the need to provide the public and officials with timely, universal access to verifiably knowledgable educators in factually based pipeline safety information was initiated in Pennsylvania; arguably the "second largest natural gas field in the world, behind only the South Pars/Asalouyeh field shared between the nations of Iran and Qatar." In reporting on the Pennsylvania gas boon, the United Press International and New York Times alone have made Pennsylvania the iconic Charles Dickens' "household word[1]" of Industry offices. However, with media and State populous focused on vetting drilling processes, permitting, regulations and environmental and social implications of hydraulic fracture extraction of unconventional Marcellus Shale gas[2], public exposure to the requirements of pipeline infrastructure remained, as in the past, an underground, hidden component.

Pennsylvania is 283 miles east to west, 170 miles north to south and totals 46,055 square miles. Before the introduction of Marcellus Shale gas infrastructure an astounding 60,418 miles of oil and gas pipeline traversed the landscape; according to PHMSA data, 96% were gas pipelines, over 2.5 million distribution lines delivered fuel. At Project inception, 67 companies were on track to drill more than 3,500 wells per year for the next decade in Pennsylvania. According to a 2011 study conducted by The Nature Conservancy in Pennsylvania, approximately 25,000 additional pipeline miles will be required to transport Marcellus Shale from these projected Marcellus Shale wells. Additionally, vast reserves of Utica Shale are located below



[1] ***Household Words*** was an English weekly magazine edited by Charles Dickens in the 1850s. It took its name from the line in Shakespeare's *Henry V*: "Familiar in his mouth as household words."

[2] Marcellus Shale : a unit of marine sedimentary rock found in eastern North America. Named for a distinctive outcrop near the village of Marcellus, New York in the United States,[3] it extends throughout much of the Appalachian Basin.[4] The shale contains largely untapped natural gas reserves, and its proximity to the high-demand markets along the East Coast of the United States makes it an attractive target for energy development.[5]

Pennsylvania's Marcellus formation; studies have not yet begun to anticipate the locations, numbers of wells nor pipeline infrastructure required for Utica Shale development.

Pennsylvania is certainly not novice to energy exploration. While Marcellus Shale development created a 21st Century Pennsylvania Energy Gold Rush, public and official perception of the effects of this rush were influenced by historic experiences of the Commonwealth's as an energy producing state.

The earliest energy production in Pennsylvania appeared as coal in about 1752, on the Indiana - Westmoreland County line in the Southwestern region of the state. In the following 259 years, Pennsylvania remained the 4th largest producer of coal in the United States (2011) and continues to transport approximately 60 percent of all its coal by railroad; alternatively by trucks and river barges.[3]

Although French explorers had discovered natives igniting gas seeping into and around Lake Erie, it was a former railroad conductor, "Colonel[4]" Edwin Drake, who dug the first successful American oil well in Titusville, Crawford County, Pennsylvania in 1859. The well only produced 25 barrels a day, but it began an international search for petroleum, and in many ways eventually changed the way we use energy.[5]

The nation's first major intrastate petroleum pipeline was built in 1879, between the Pennsylvania Counties of McKean and Lycoming in NorthCentral Pennsylvania.

The first hydraulic fractured unconventional gas well east of the Mississippi, was drilled in Pennsylvania, in 2004. Range Resources'[6] "Renz 1" is located in Washington County, in the same Southwestern region of Pennsylvania where coal first appeared.

During the initial years of Marcellus Shale development, the Industry focused on locating and obtaining permits for the most profitable well sites. Wells were often drilled and capped. The rural areas in Southwestern and Northeastern Pennsylvania were the first geographic areas of exploration and drilling, therefore these regions were the first to learn about how unconventional gas is transported. As reported, from 1752 to today's markets, Pennsylvania coal is transported predominantly by railroad or by trucks and barges via rivers. Specific to the geographic areas of Marcellus Shale, existing pipeline infrastructure was laid in a distant enough past to leave pipelines off public and official radar. Therefore, Pennsylvania's energy transportation experience in these regions has largely been seen as coal transportation by rail and truck. Given this legacy, it is not surprising that a popular perception existed that trucks, rail and barge would

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[3] Allegheny Conference: Economic Impact of Coal in Pennsylvania

[4] Self proclaimed Colonel for his time as a railroad conductor

[5] http://www.priweb.org/ed/pgws/history/pennsylvania/pennsylvania.html

[6] Range pioneered the Marcellus Shale play in 2004 with the successful drilling of a vertical well, the Renz #1.

transport Marcellus Shale gas. With a State populous focused on vetting drilling processes, permitting and regulations related to the extraction of the unconventional[7] Marcellus gas by hydraulic fracturing[8], pipeline infrastructure remained, as in the past, an unseen, underground, hidden component

The 2009 "frack water spill" and well contaminations in Dimock, PA shifted public and official attention from Marcellus Shale wells to potential environmental impacts to land and water resources caused by fractured drilling practices. The differences between coal, conventional gas and unconventional gas extraction came under scrutiny and the fact that, unlike coal, unconventional natural gas is transported by pipeline infrastructure was realized.

Pennsylvania became a reactive state in several ways. During the Project timeline alone (2011 - 2012) events occurred in Pennsylvania that influenced grant work and surrounding states:
First: was the speed of development of unconventional gas resources and the resulting collective community demand for readily available gas development data and education.
Second: unprecedented State regulatory changes.
Third: multi-state cooperative efforts to share, expand and support educational opportunities between Pennsylvania, New York, New Jersey, Delaware and Maryland.
Fourth: a convergent awareness of pipeline incident related deaths due to deteriorating and old infrastructure with a proliferation of new pipeline infrastructure.

Speed and Educational Demand: Public demand for readily available gas development data and education was initially sought from the Pennsylvania Department of Environmental Protection (PA DEP). PADEP responded swiftly with internet access to data, however acknowledgement by the Department of flawed and incomplete data anecdotally resulted in mistrust of information produced by official agencies. Communities, NGOs[9] and government organizations began to pro-actively search for independent information and education in matters of pipeline infrastructure and safety.

By June 2012 the Carnegie Museum of Natural History Pennsylvania Unconventional Natural Gas Well Geodatabase, had provided perhaps the only comprehensive list of wells in the state. The database revealed 9,848 Pennsylvania Marcellus shale natural gas wells; fountainheads to pipeline infrastructure. Carnegie data confirmed the birth of the new frenzy being experienced by Pennsylvanians; the building of infrastructure. Visage of a staggering infrastructure requirement for the existing 9,848 wells in Pennsylvania begat the need for speed in public education.

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[7] Canadian Association of Petroleum Producers: The key difference between "conventional" and "unconventional" natural gas is the manner, ease and cost associated with extracting the resource.

[8] the propagation of fractures in a rock layer, by a pressurized fluid.

[9] Non Government Organizations

Unprecedented Regulatory Changes: Two specific Pennsylvania regulatory changes of astonishing import, unprecedented swiftness in their introduction, vetting and adoptions occurred during the Project. Inclusion of these Acts are therefore appropriate background. Both Acts pertain specifically to Marcellus Gas Development as relates to pipeline infrastructure, siting and safety. Both drew into question the ability of a training program to keep pace with regulatory changes being made to keep pace with Pennsylvania's unconventional gas development.

Act 127

The Gas and Hazardous Liquids Pipelines Act (also known as "the Pipeline Act" or Act 127) was signed by Governor Corbett on December 22, 2011. With the March 16, 2012 implementation of Act 127, the Pennsylvania Public Utility Commission Public Utilities Commission (PUC) gained the authority to enforce federal pipeline safety laws as they relate to non-public utility gas and hazardous materials pipelines and facilities. The Act, however, created grey areas of overlap and gaps in reporting siting and safety, and regulatory authority. Since Class 1 gathering lines remain exempt from PHMSA authority they are exempt from PUC safety authority. The Act does provide that PUC establish and maintain a registry of the locations, miles and size of pipelines, pressures, and named operators of *all* gas pipelines in Pennsylvania. Class 1 gathering lines are to be included in registry of miles of pipeline.

The Commission will recover the costs of this program by assessments on pipeline operators based on the total intrastate regulated transmission, regulated distribution and regulated onshore gathering pipeline miles in operation for the transportation of gas and hazardous liquids in Pennsylvania during the prior calendar year. Non-compliance by pipeline operators is subject to a retroactive $10,000/day fine.

The registry does not give PA PUC siting authority over non-interstate lines, however the registry does provide the PA PUC with the power to track and maintain records of the location of intrastate pipelines. As an example, Class 1 pipelines are not subject to Part 192 safety authority yet operators are required to report all Class 1 locations and miles for PA PUC informational purposes as part of the Act 127 registry.

Operators who are planning pipelines, but do not yet have pipelines constructed must register the location, size and pressure prior to construction and register zero miles until construction is in progress.

Entities which are completely exempt from PHMSA jurisdiction are not required to register as pipeline operators, however the PA PUC is still seeking comment on the issue of registration of production and Class 1 pipelines which have distribution service such as farm taps. The PA PUC's present understanding is that PHMSA considers farm taps as regulated distribution service regardless of their Class location.

ACT 13

The Act Amending Title 59 (Oil and Gas) of the Pennsylvania Consolidated Statutes (also known as Act 13) was signed by Governor Tom Corbett on February 14, 2012 and went into effect on April 14, 2012. The Act requires municipalities to allow oil, gas, and water pipelines in all zoning districts. It also implements a drilling impact fee to be paid on each unconventional horizontal and vertical gas well by county, with collection and disbursement of the funds from the fee to be managed by the PA PUC.

The most controversial element of Act 13 stripped away local zoning laws, eliminated the legal concept of a Home Rule Charter, limited private property rights, and in the process, disempowered municipal governments. This has direct implications for local planning regarding the siting of natural gas pipeline infrastructure. Before Act 13 was passed, Lycoming County had just updated its county-wide zoning ordinances in 2011 to address many aspects of oil and gas development, including requiring pipeline operators to obtain zoning permit approval for gathering pipelines that cross public roads or floodplains. In July 2012, Pennsylvania Commonwealth Court declared the municipal preemption provisions of Act 13 unconstitutional, null, void, and unenforceable and allowed an injunction on its implementation to remain in place while the case proceeded to the Pennsylvania Supreme Court. On October 17, 2012, the Supreme Court heard oral arguments regarding the Act's constitutionality.

Multi-state cooperative efforts to share, expand and support educational opportunities: Subjective to unconventional gas development, Pennsylvania legislative actions such as Act 13 and Act 127 have been initiated in contiguous states as well, drawing heightened interest from media, legislators and the public. For the first time since Pennsylvania Representatives Schroder and McIlvaine introduced HB 1817, an Act authorizing the Commonwealth of Pennsylvania to create a Mid-Atlantic Area Natural Gas Corridor Compact in 2010, legislative and grass roots mid Atlantic communication have begun to develop. A TAG intention for multi-state information sharing and for PPSEP to be used beyond Pennsylvania, compelled vetting curriculum through interstate resources during the project.

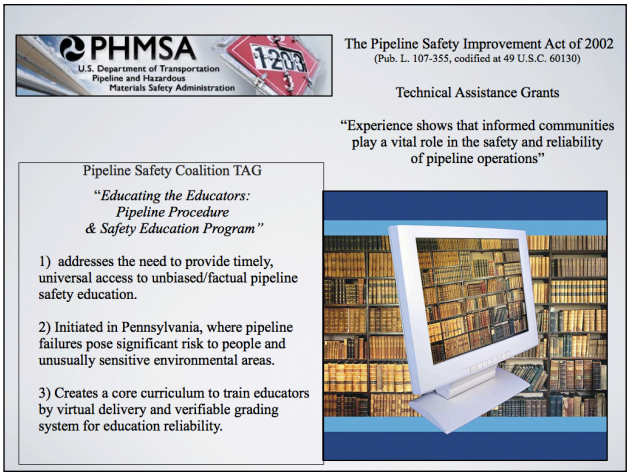
Convergent Impact of Pipeline Incident Death Awareness: Public awareness of Industry's "need for speed" in Marcellus infrastructure expansion clashed with public horror in media viewings of gas pipeline explosions. Deaths in Pennsylvania caused by aging infrastructure in Allentown and Philadelphia spurred fear, and a thirst for knowledge, about siting and safety; process and public participation. Citizens, land use planning agencies and elected officials began reaching out to Pipeline Safety Coalition (PSC) with the literal requests, "The pipelines are coming; what do we do?" and "How do we keep from being the next Allentown?"

Concurrence of these factors in the research and development of PPSEP curriculum was timely. The goal of addressing an entire state in which a pipeline failure could pose significant risk to people and unusually sensitive environmental areas took on heightened urgency. Incorporation of PIPA into the curriculum and an advocacy for universal adoption of PIPA recommendations took on heightened urgency in planning for Pennsylvania's future through education.

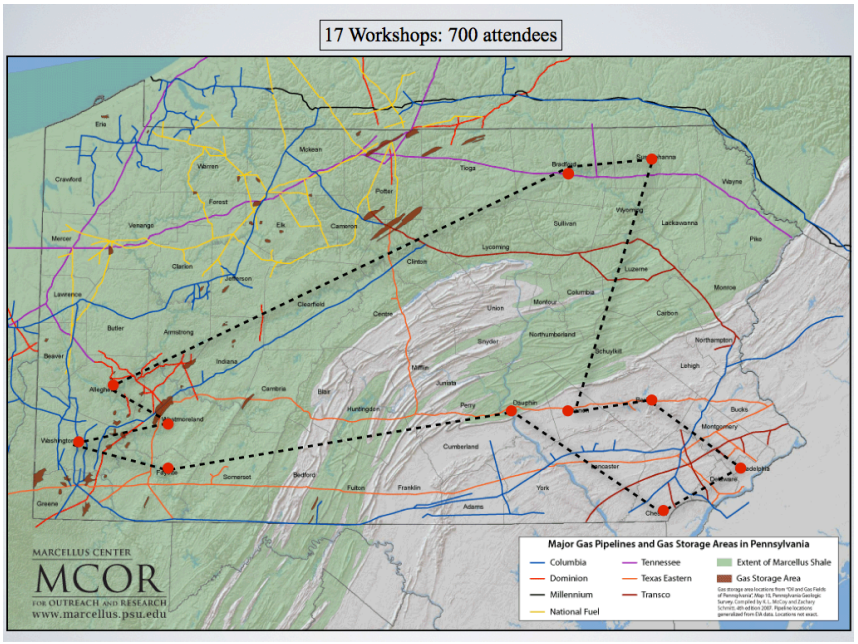
The Project addressed these factors while retaining the two tiered primary focuses of 1) vetting curriculum and 2) creating a verifiable system of delivery.

Process

Vetting Curriculum: Curriculum is prescriptive and based on a syllabus specifying what topics must be understood and to what level in order to achieve a particular grade or standard. PPSEP is not intended to license an educator, rather PPSEP is intended to educate and certify trained educators through virtual course delivery and a verifiable grading system for education reliability. To be certified by PPSEP, an educator must: 1) have met the requirements for taking the course, 2) taken the course and 3) passed an exam.



Vetting curriculum took an unexpected turn in approach with stakeholder outreach to Pipeline Safety Coalition (PSC). In the need to respond to the speed of Marcellus Shale development, public and official outreach for education in pipeline procedures, safety, land use confirmed a need for more educators throughout the state with their calls to PSC. Providing programs to those seeking education afforded the Project to simultaneously conduct survey and data collection for PPSEP curriculum.



Vetting curriculum therefore began with input from the breadth of Pennsylvania's communities and geographies. In the twelve month grant period 17 programs reaching 700+ attendees were conducted. The seeds of continuing education partnerships planted.

EVENTS AND PARTICIPANTS:

Calendar of Events	Audience	Location	Topic
Oct 4, 2011	County Commissioners	West Chester PA	Pipeline Placement & Safety: What PA County Commissioners Need to Know
Oct 11, 2011	League of Women Voters of Washington County	Canonsburg, PA	Pipelines 101
Oct 15, 2011	Peters Township Marcellus Shale Awareness: Health and Education	Peters Township, PA	Marcellus Shale & Pipeline Infrastructure: "What You Need to Know and Why"
Oct 24, 2011	Chester County Pipeline Task Force	West Chester, PA	Pipeline Education and Participation in Chester County
Nov 1, 2011	Gasworks	Conference Call	Conference Call - input on Educations, what NGOs need to know: Pipeline Placement & Safety
Nov 7, 2011	Women In Ag Day	Penn State University	Women In Agriculture Conference: Intro & Survey: Educating the Educator (PPSEP)
11/16/11- 11/18/11	Pipeline Safety Trust Conference	New Orleans, LA	Educating the Educator: PPSEP introduction/survey needs
Nov 30, 2011	Gasworks	Conference Call	What do NGOs need to know: PPSEP
Dec 16, 2011	Gasworks	Conference Call	What do NGOs need to know: PPSEP
Jan 4, 2012	UGI Utilities	Reading, PA	Meeting: Eric Swartley Manager Compliance & Damage Prevention Introduction PPSEP
Jan 6, 2012	Gasworks	Conference Call	What are citizen members of NGOs asking: PPSEP
Jan 11, 2012	Stormwater Group	Conference Call	What do NGOs need to know: Pipeline Placement & Safety
1/17/12 - 1/20/12	PRCI / PG&E	Livermoore, CA	PRCI / PG&E / Industry Representative meeting Intro /Input / Partnering Opportunities/ PPSEP
Jan 26, 2012	Commissioner Cazzone	West Chester, PA	Introduction and Input: PPSEP: Chester County: Urban/Suburban/Agricultural Communities
Feb 1, 2012	Commissioner Costello	West Chester, PA	Introduction and Input: PPSEP: Chester County: Urban/Suburban/Agricultural Communities
Feb 14, 2012	Responsible Drilling Alliance	Phone Interview	Introduction and Input: PPSEP Lycoming, PA - Rural communities
Feb 17, 2012	Stormwater Group	Conference Call	What are citizen members of NGOs asking: PPSEP
Feb 23, 2012	Chester County 2020	Coatesville, PA	Community and Agricultural Outreach Organization: Intro and Input PPSEP
Feb 29, 2012	UGI Utilities	Swatara, PA	Meeting: Eric Swartley Manager Compliance & Damage Prevention: UGI Pertnership: PPSEP
March 13-14, 2012	PA WAgN	Liberty Township, Penn	Pennsylvania Women in Agriculture Network Annual Meeting: Intro and Input PPSEP
Mar 20, 2012	Pittsburgh Marcellus Protest	Pittsburgh, PA	Marcellus Shale and Pipeline Infrastructure: "What You Need to Know and Why"
4/9-412/12	Wysox/Susquehanna/Bradford Counties	Northern PA	Community meetings: Rural Pennsylvania: Inroduction/Input for PPSEP
Apr 18, 2012	Creative Economy Enterprises Sustainability Series	West Chester, PA	The Marcellus Shale and Pipeline Imipact: What You Need to Know and Why
Apr 19, 2012	Stormwater Group	Conference Call	What do NGOs need to know: PPSEP
Apr 20, 2012	UGI Utilities	Phone	Meeting: Tony Cox, Midstream Business Development: UGI Partnership: PPSEP
Apr 27, 2012	Gasworks	Conference Call	PPSEP - partnering with NGOs
May 11, 2012	Frack Action Committee	Malvern, PA	Introduction and Input: PPSEP: Chester County: Urban/Suburban/Agricultural Communities
May 30, 2012	Berks Gas Truth	Berks County, PA	Marcellus Shale & Pipeline Infrastructure: "What You Need to Know and Why" Intro and Input: PPSEP
6/1-3/2012	Pipeline Safety Trust Advocate Meeting	San Francisco, CA	Introduction and Input: PPSEP: National Perspective: Needs Assessment
Jun 21, 2012	Local Government Academy	Pittsburgh, PA	: Managing Marcellus Pipelines: Pipeline Infrastructure: "What You Need to Know: and Why"
Jul 7, 2012	Gasworks	Conference Call	PPSEP - partnering with NGOs
Jul 13, 2012	UGI Utilities	Swatara, PA	UGI Partnership: PPSEP
Jul 28, 2012	stormwater Group	Conference Call	PPSEP - partnering with NGOs
Jul 31, 2012	Charlestown TAG Workshop	Willistown Twp, PA	COMMUNITY PARTICIPATION: PPSEP
8/5/6/7/2012	Ecological Society of American XX Annual Conference	Portland, OR	Ecological Society of America: OOS 3: Natural Gas: Ecology, Environment, and Economics "Public outreac
Aug 13, 2012	Gasworks	Conference Call	PPSEP - partnering with NGOs
Aug 30, 2012	stormwater Group	Conference Call	PPSEP - partnering with NGOs
September 20-22, 2012	Farm Aid	Hershey, PA	PPSEP - partnering with Farm Aid: Farm Aid Forums: Farmers and Natural Gas Development: Partnering w.

Simultaneously, PSC began participating in monthly conference calls with 50 non government organizations (NGO) from 6 states[10] eager to share knowledge, ask questions and find answers in pipeline matters. The meetings were valuable in networking and in gleaning needs in pipeline safety education from a broad demographic of representative NGOs interested in pipeline safety education. Often an educator's best guidance in teaching is gained through listening to questions. Such was the case with this opportunity.

Early on, the Project was approached by Dr. Nathan Phillips, Boston University, Department of Geography and Environment regarding PSC's Technical Assistance Grant work. Dr. Phillips invited PSC to submit an PPSEP abstract for consideration in an Organized Oral Session of the Ecological Society of America Annual Meeting. The abstract (Appendix) was accepted, PSC presented, "Public outreach, and awareness to enhance environmental, and public safety in natural gas infrastructure" which provided the opportunity to vet PPSEP through an international environmental and scientific community.

Finally, the Annual Farm Aid Concert was scheduled in Hershey, Pennsylvania. In order to reach a broad farming community, the Project contacted Farm Aid organizers, summarized the Project

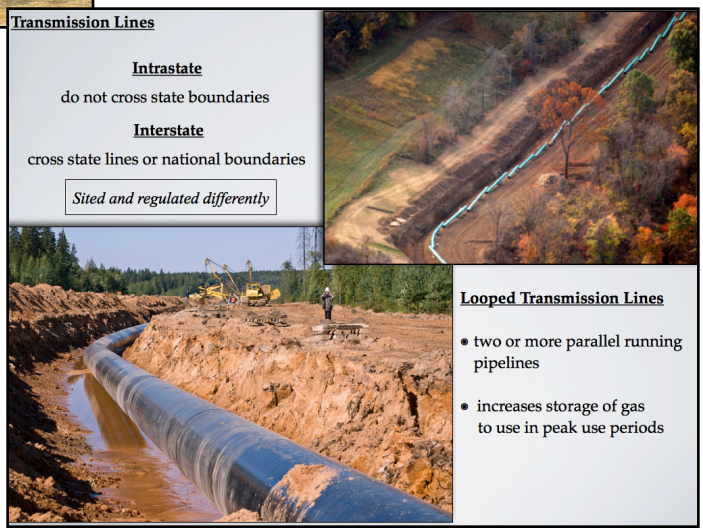
[10] Pennsylvania, New York, New Jersey, Maryland, Delaware and Massachusetts

and obtained invitation to participate in a two day, preconcert Farm Aid workshop and training event. The meetings provided an opportunity for input not only from Pennsylvania farmers but farmers across country and across the world.

The Template: The template used for vetting was created using basic pipeline siting and safety information; in what is often referred to as Pipelines 101. The Project also sought input, expertise and experience from partners, including but limited to: Pipeline Safety Trust's New Voices Group, UGI Utilities, PA PUC, Pennsylvania League of Women Voters, PA One Call and PHMSA.

Evolution of the program was primarily derived from public input and was appropriately dubbed, "What You Need to Know and Why." The program became based on: "Terminology, Who Regulates What, Pipeline Siting Process, Pipeline Safety and Your Role in Pipeline Development and Safety." In keeping with the three pronged approach to urban, suburban and farming communities, each program was tailored to audiences geographic and sociological input.

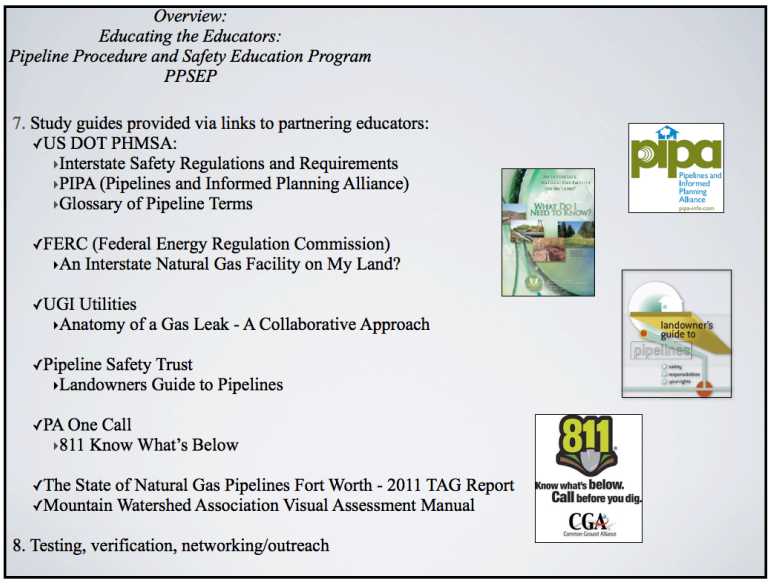
Program audiences consisted of learners and potential educators; citizens, land use planners, elected officials, government and non-government entities, activists, students and media. The diverse makeup of workshop attendees resulted in surveying an expanded audience from rural, suburban, farming to government, non government - who by their own right will become educators. Attendees engaging in "What You Need to Know and Why" were drawn into probative questioning, allowing the Project to conduct needs assessments, to gauge adjustments in programing and measure public interest in participation of such a training program. As example, the Pittsburgh Local Government Academy (LGA) engages government officials in 24 counties. Their initial educational program resulted in four requests to PSC for copies of the "What You Need to Know and Why" program for County use. LGA continues consulting PSC and is organizing 2013 workshops to include PHMSA, One Call PAPUC and PSC. All presentations are available @ www.pscoalition.org



Pipeline Safety Coalition Sample Slides: What You Need to Know and Why

Feasibility Study: Virtual Course Delivery

The Project sought expertise in conducting a feasibility study for virtual course delivery of a defined and verifiable system with education reliability. The Pennsylvania based company, Intelivert was contracted for their diverse experience in video training and communications, their work with continuing medical education protocol with clients such as Will's Eye Hospital, Philadelphia, PA and expertise in budget conscious projects. The five step science based approach to continued medical education of the Accreditation Council for Continuing Medical Education (ACCME) was vetted by Intelivert and recommended as protocol for PPSEP.



Core to the protocol is student registration to the website, a view of course outline and requirements needed to complete course, prerequisite requirements, and registration to the course.

A student is then guided to partnering links and study guides. Each study guide must be read and a student is guided to testing. If the wrong answer is submitted, the program takes the student back until they are able to answer the question correctly.

A User survey is then requested to gauge perception of material and efficacy of the program.

A student who has successfully completed the exam may download a certificate and will be given the option to remain a member of the website to continue education and network with stakeholders in need of educational.

The program additionally includes the option of making the course available to view without requiring a viewer become a student. This affords the public a one stop approach to heightening community awareness.

The feasibility study follows in full.

Educating the Educators
Pipeline Procedure and Safety Education Program (PPSEP)
Feasibility Report

September 28, 2012

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OVERVIEW

Pennsylvania is home to one of the largest reservoirs of natural gas in the world. As such, the Commonwealth is poised for expansion and development of vast interstate and intrastate pipeline infrastructure necessary to transport Marcellus Shale natural gas to markets throughout Pennsylvania and beyond state lines. This presents a unique opportunity for all stakeholders to work in unison, as equally informed and participating entities who will create an infrastructure that begins with safety in the fullest sense of its definition.

The purpose of this document is to report on the feasibility of delivering the **Pipeline Procedure and Safety Education Program (PPSEP)** via a web portal for learning. The system should be capable of delivering pipeline safety information, orientation, and virtual training and certification to online users in Pennsylvania, but be scalable and flexible enough to deliver state-specific educational content and certification to users anywhere in the United States. The online learning portal must:

- Effectively address risk management through education and awareness
- Be scalable and usable in states other than Pennsylvania
- Effectively deliver the curriculum online
- Include a verifiable system of grading and the ability to measure participation and curriculum effectiveness
- Include delivery and collection of surveys in order to self-evaluate
- Provide measurable, transferrable results
- Disseminate information to groups and communities

This report will address the above requirements as well as the:

- Learning portal requirements/specifications
- Learning portal interactions with internal or external systems and/or processes
- Curriculum content creation and integration
- Learning portal development and deployment (including cost estimates)
- Ongoing Learning portal hosting and maintenance (including cost estimates)
- Project risks and constraints
- Additional Recommendations

ONLINE LEARNING FEASIBILITY

When attempting to deliver any learning experience, it is important to recognize that people learn in different ways. Learning styles (visual, auditory, verbal, kinesthetic, social, solitary) have been classified and grouped in various ways, but it is fair to say that most people learn using a combination of styles. Any communication, whether a television commercial, new employee orientation, continuing education, or pipeline safety training is delivered with the intent that viewers will learn something from it. Presenting a message in a way that appeals to multiple learning styles will allow learners to absorb more of the material presented, improve the effectiveness of the learning experience, and lead to a better-informed workforce or customer base.

When designed appropriately, a multimedia, interactive, online experience can cater to most learning styles. Video speaks to auditory and visual learners, while simultaneously providing motion, sound and sometimes, interactivity. Kinesthetic learners can learn effectively through interactive online demos, or when material is presented in game-like form. Social learners benefit when rich media is integrated with social platforms, enabling users to comment, ask questions, or interact with others.

The combination of online delivery and rich media content (video with presentation and interactivity) which has been tailored to accommodate the learning styles of end users can make for an extremely effective communications approach. Online learners can review material that is presented in the way they like to learn, they can review the content in privacy without the distraction of other people (as in a classroom setting), and they can move through the material at their own pace.

A recent study by the University of Manchester found that students preferred full lecture video to other rich media formats (narrated slides, short-video segments or audio podcasts). Participants of this study said that full-length video was like a "comfort blanket", delivering the richness of the entire lecture, enabling students to view sections they had missed or failed to understand the first time around.

Today's "learners" are visually sophisticated and have become accustomed to high-end, production – and the younger the learners are, the more important the use of rich media in your communications becomes if you are to maximize the message effectiveness. Rich media can be immersive, engaging, and entertaining—and because of its digital nature, its reach and effectiveness can be easily measured.

As you will read in this report, we believe an online learning portal is not only feasible, but may offer the most effective, measurable way to deliver pipeline procedure and safety information and PPSEP certification to citizens in Pennsylvania – or to any State.

Other considerations that speak to and support the use of online learning portal feasibility are included in APPENDIX A – Online Learning Advantages & Considerations of this document.

SYSTEM REQUIREMENTS

After several meetings with Pipeline Safety Coalition leadership, we have identified the following requirements for an online learning portal for PPSEP. System requirements identified thus far are as follows:

Learning Portal Purpose

The online learning portal must deliver the **Pipeline Procedure and Safety Education Program.** It must initially be available to users in Pennsylvania, then potentially to users anywhere in the United States. It must deliver pipeline procedure and safety information to citizens in communities across the State. A key goal of the portal will be to "Educate the Educators", providing a measurable process for certification of **Pipeline Procedure and Safety Educator** certification. Following certification, educators would be qualified to speak intelligently to groups of concerned citizens, pipeline companies, local state and federal government entities, non-governmental organizations and the media. The online learning portal should include survey and/or other feedback mechanisms that would provide self-evaluation and proactive improvement of the portal and the curriculum provided.

Learning Portal Access

System must handle Identity Management (appropriate site access) for the following User Types:

- **Anonymous** – Users who have not registered on the site, and have access to general site information (This may include landowners or other affected citizens seeking unbiased information in the regulatory and siting process as pertains to pipeline safety.)
- **Registered** – Users who have registered on the site, access the site with a username and password, and have greater access to site content including the **Pipeline Procedure and Safety Educator** certification program. (Registered users have the option to complete

certification. Once the registered user begins the certification process, they have 60-90 days to complete certification. If they do not complete the certification process within the allotted time-period, the user will be directed to start the certification process over again.)

- **Certified** – Users who have registered on the site, access the site with a username and password, have completed the **Pipeline Procedure and Safety Educator** certification course, and have access to download additional "Certified Educator" content (i.e. presentations, speaking engagement requests, Certified Educator-specific communications, etc.)

- **System Administrator** – Users who access the site with a username and password, may or may not have completed the **Pipeline Procedure and Safety Educator** certification program, and have access to site administration tools including the ability to:
  - Assign access credentials
  - Create and edit portal content
  - Manage curriculum creation process
    - Create State-specific certification curriculum
    - Upload video-based courseware to the portal
    - Create and edit certification course test questions
    - Create and edit certification course survey questions
    - Access and download reports
      - Site users and usage
      - Course completion and certifications
  - Three (3) levels of Administrators are anticipated:
    - Super Administrator (access to all system features and functionality)
    - State Administrator (admin functions as appropriate by state)
    - Federal Administrator (admin functions as appropriate to Federal regulatory and siting authority pertaining to Pipeline Safety)

System Administration Tools

The system must provide easy creation, management and delivery of information and certification course content and must be simple to use and to maintain. Site administration and content creation and maintenance must be accomplished with basic WYSIWYG (wiz-ee-wig) editing tools and must require no coding, such that non-technical users can easily manage the site and its content.

Note: WYSIWYG is an acronym for "What You See Is What You Get". The term is used in computing to describe a system in which content (text and graphics) displayed onscreen during editing appears in a form closely corresponding to its appearance when displayed as a finished product, which might be a printed document, web page, or slide presentation.

Curriculum

Once registered, Pennsylvania users of the site will have access to the **Pipeline Procedure and Safety Educator** certification curriculum. The learning portal will accommodate the creation, management, delivery and verification of certification.

Course categories for Pennsylvania may include but not be limited to the following:

1. Pipeline and Hazardous Materials Safety Administration (PHMSA)
   - Interstate Safety Regulations and Requirements
   - PIPA (Pipelines and Informed Planning Alliance)
   - Glossary of Pipeline Terms

1. Federal Energy Regulatory Commission (FERC)
    - An Interstate Natural Gas Facility on My Land
2. UGI Utilities
    - Anatomy of a Gas Leak – A Collaborative Approach
3. Pipeline Safety Trust (PST)
    - Landowners Guide to Pipelines
4. PA One Call
    - 811 Know What's Below

Each course category listed above may include content appropriate for the following communities:

- Suburban/Urban
- Marcellus Shale
- Farming

Certification Process

The online learning portal should incorporate a verifiable course completion, testing and certification process to validate user completion of curriculum presented. The system should include an accepted standard for certification, such as that currently used for Continuing Medical Education (CME). The accreditation body for CME is the Accreditation Council for Continuing Medical Education (ACCME). The purpose of the ACCME requirements is to set expectations for accredited education providers that ensure the CME is:

- Independent and unbiased
- Based on valid content and
- Contributes to health care improvement for patients and their communities

While there is not currently a governing body (similar to the ACCME) for pipeline procedure and safety education, a similar process may be used in the delivery of course material. We believe this approach will add a level of credibility and transparency to the certification process, with or without an accreditation body. The following is an example of the certification course process, based on the current requirements of CME. It is a five-step process that includes the following:

1. Review Disclosure Statement – Disclosure provides transparency in the process, making those who take the course aware that course presenters do not represent any special interest group – nor are they being compensated by any special interest group. CME disclosure includes the following:

- Course Presenter(s)
- Course Duration
- Intended Audience
- Peer Reviewers
- Original Release Date
- Last Review Date
- Expiration Date
- Program Overview
- Learning Objectives
- Accreditation
- Completion Instructions
- Computer Requirements

2. View Course – After reviewing the course disclosure, learners can review the course material. Material may include:

- Rich media video course content
  - Presenter video
  - Presentation (PowerPoint, video, web content)
  - Links
  - Documents

3. Take Post-Test – After the learner has viewed the course, they take a post-test. The post-test functions in the following way:

- After the learner submits test answers, the system will indicate any incorrect answers
- Learner will have an opportunity to select another answer until all answers are correct
- Learner can go back to review the course at any time during the process

4. Complete Evaluation – Following the post-test, the learner is asked course evaluation questions. Survey responses are saved in the portal's database and results are available in system reports. Survey responses are focused on the learner's experience and usefulness of the course. The survey data are used to proactively improve course materials, content and choice of presenters.

- User completes the course evaluation

5. View and Download Certificate of Completion – After evaluation completion, learners can view and download a personalized certificate of completion. Registered site users have access to a "My Account" section of the portal where all of the learner's course information is kept, including courses in progress, courses completed and certifications completed.

- User will be able to download and print certificate
- Course progress and completion will be available to the user in the "My Account" area of the portal

In summary, this certification process, following similar guidelines to those for Continuing Medical Education will provide a number of advantages to the Pipeline Safety Coalition Technical Assistance Grant initiative, PPSEP. The process will:

- Effectively deliver curriculum online to any numbers of groups and communities
- Provide measurable results through certification, testing, evaluations and site usage metrics
- Provide a verifiable system of grading with the ability to measure curriculum effectiveness through course evaluations
- Address risk management concerns for groups and communities within the State(s)
- Be flexible and scalable such that the system could be used in any State in the US
- Include delivery and collection of surveys in order to self-evaluate (through course Evaluations)

Content Creation

To be most effective, the online learning portal should provide an easy way for course content to be created, managed, delivered and updated. It is likely that many site administrators and users will be non-technical. If the site – or its tools are complex, the site will not be used. For

this reason we are suggesting technology that will make curricula simple to create, easy to manage, and extremely effective in delivering the communication and training you intend.

A content creation computer such as the Cbox Studio from manufacturer Winnov, is one such content creation computer. The Cbox Studio is a multimedia production-studio-in-a-box, allowing the non-technical user to combine:

- Presenter video
- Computer output (PowerPoint or Keynote presentation including animation, web pages, documents, etc.)
- Additional video sources (DVD player, additional cameras, projector, etc.)
- Additional audio sources (music, audience microphones, etc.)

Figure 1 - The Cbox Studio allows for easy creation of course content, which can formatted for any device

The Cbox Studio is a fully integrated video capture solution used to record and webcast training, presentations or events. The Cbox enables a non-technical user to produce rich, professional looking content for the web and mobile devices.

Figure 2 – Online training sample including: Presenter video and PowerPoint presentation

Scheduled or impromptu recordings are simple, allowing the educator to demonstrate and share complex concepts and techniques, react to changing regulations, or deliver emergency training, on-demand. An integrated scheduler and touch screen interface empowers non-technical users to record and broadcast live presentations effortlessly. Recordings are instantly available in multiple formats (playable on computers, tablets and smartphones) and can be uploaded, published and shared with constituents.

Organizations can drastically reduce or eliminate video production costs. The Cbox accepts multiple tilt/pan/zoom cameras inputs, along with multiple audio and video sources. It provides extensive capabilities and professional output, and it can integrate with the learning portal – all for about the cost of a single multi-camera video production.

The chosen portal technology should integrate with a training tool like the Cbox Studio, allowing easy course creation and direct upload of recorded courseware. The portal should also accommodate upload of existing video assets, in multiple formats.

Learning Portal Development/Deployment

The learning portal should be developed on a proven technology platform – one that already has the desired features outlined in this report, or one that can be quickly customized at reasonable cost. We recommend that the learning portal not be developed from scratch, as this option may be both cost and time prohibitive. The platform should be flexible in terms of integration possibilities (as with the Cbox Studio or other systems) and should be scalable in the event that States beyond Pennsylvania would like to utilize the system.

Development for the online learning portal should be accomplished in a matter of weeks, not months. If it takes more than 12 weeks to get a solution (such as the one described in this document) in place, it is highly likely it is not the right solution and may cost more than necessary. The portal development team should be housed in one location. A geographically dispersed team can introduce communication issues and can translate into higher project risk.

Learning Portal Hosting & Maintenance

We highly suggest the Pipeline Safety Coalition consider a portal product that is offered as Software-as-a-Service. Software-as-a-service (SaaS) can provide a more efficient and cost-effective alternative for your organization to achieve its objectives. SaaS – meaning delivering software over the Internet, is increasingly popular for its ability to simplify deployment and reduce acquisition costs. A SaaS offer can provide better efficiency and scalability of applications, with no drain on internal resources – all at very reasonable, predictable pricing. Once your product is configured, tested and deployed, SaaS services should include:

- Hosting
- Content Delivery Network (CDN) Integration (helps ensure a quality user experience for site users)
- Maintenance
- Back-up and Recovery
- 800 Help Desk

The chosen SaaS portal provider should offer a number of hosting options including cloud, private cloud or private data center. Additional benefits of a provider that offers their portal product as SaaS include:

- **No Hardware or Software to Install** – Because solutions are in the cloud, curriculum is available quickly with minimal set up, allowing users can get started immediately.
- **Backup and Recovery** – SaaS provider should provide redundant data protection and the advanced facilities protection, along with a data recovery plan.
- **Superior Scalability** – As your organization scales to meet market demands, a SaaS provider can adjust with you. Cloud infrastructure is elastic – it can scale up to tens of thousands of users or down to a few according to your organizational needs.
- **Automatic Upgrades** – Automatic system upgrades ensure that your users seamlessly transition onto the latest features without wasting time or resources.
- **Painless On boarding** – No intensive training required. The chosen provider should provide a user-friendly interface and intuitive design to make it easy for new users to start using the solution right away.
- **Roll-Out Support Services and Ongoing Support** – SaaS provider should have an experienced Customer Engagement Team, allowing you to leverage industry experience and product knowledge.

LEARNING PORTAL – SAMPLE SCREEN SHOTS

The following screen shots and content are for demonstration purposes only.

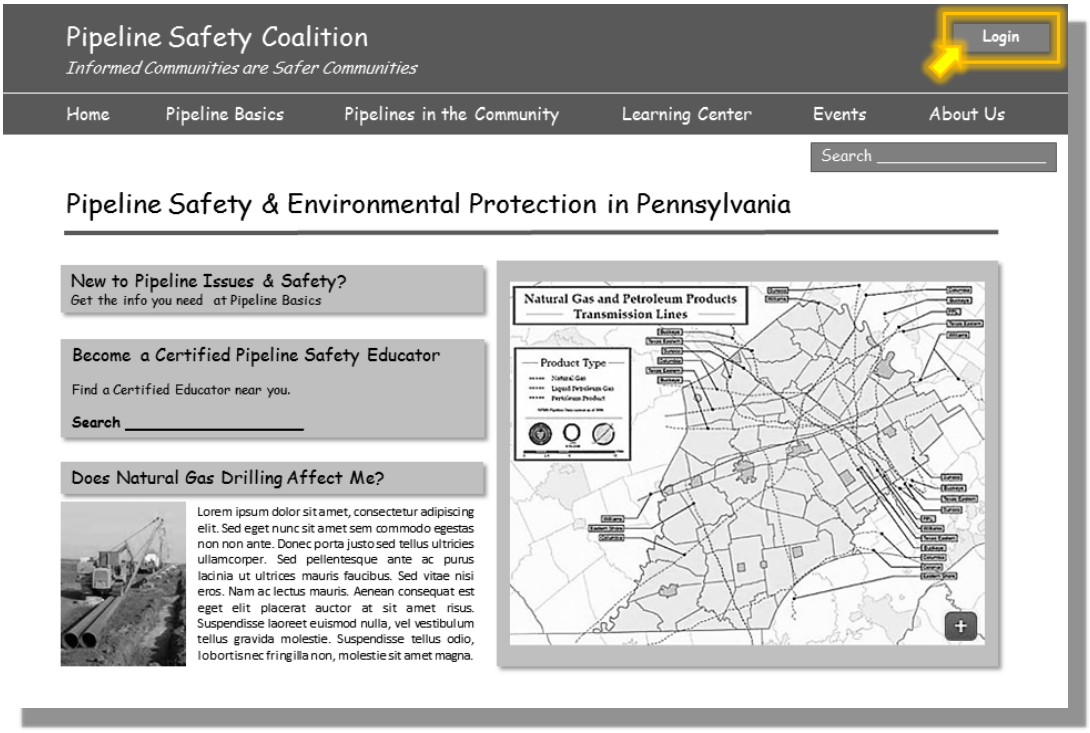

Figure 3 – User logs on to the Learning Portal

Figure 4 – User goes to Learning Center

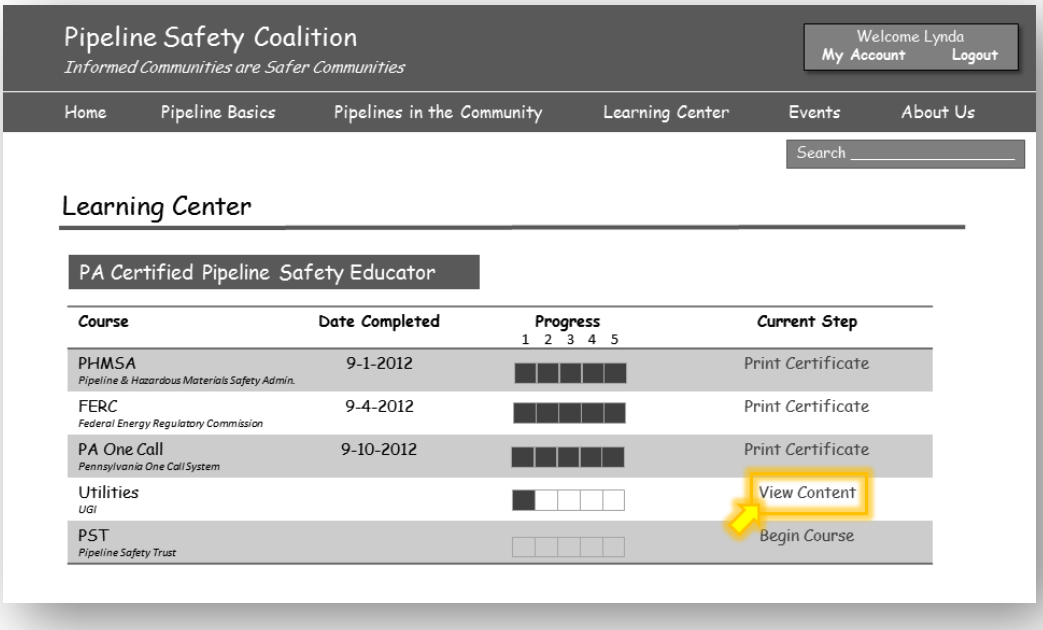

Figure 5 – User Views Certification Progress

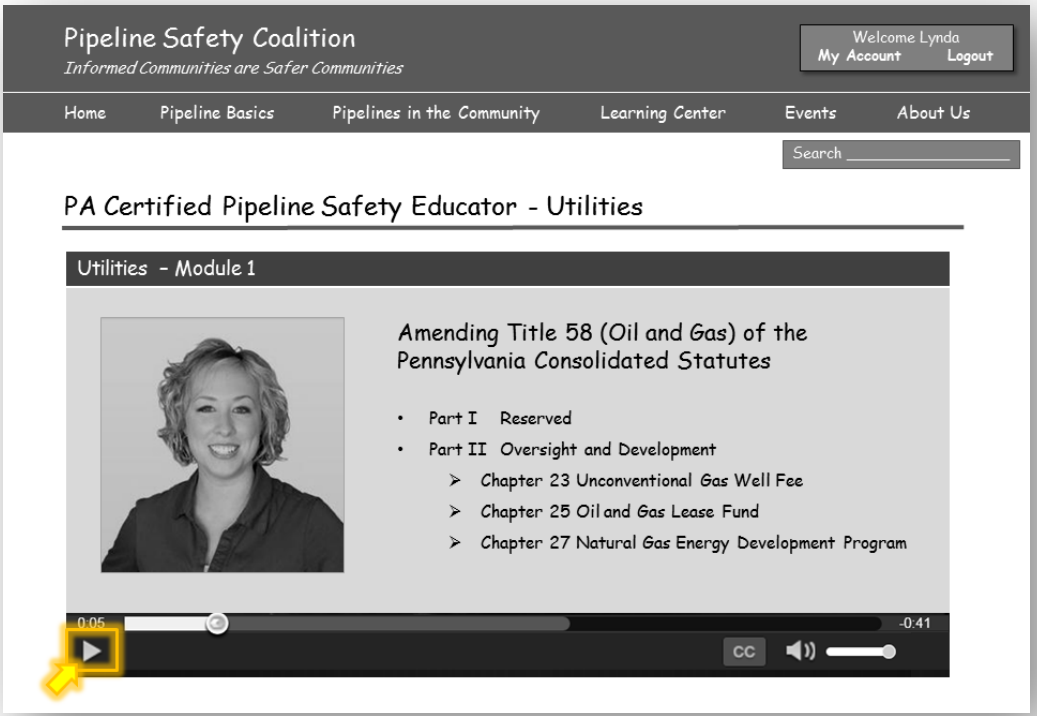

Figure 6 – User Views Course Content

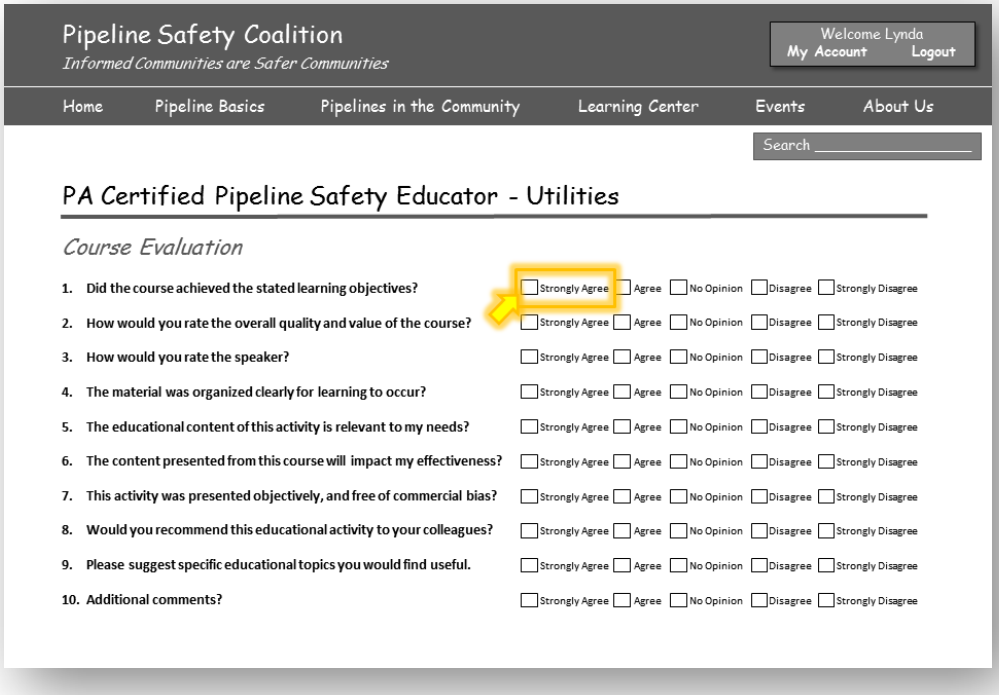

Figure 7 – Following the Post-Test, User Completes Course Evaluation

ADDITIONAL RECOMMENDED PORTAL FEATURES

The online learning portal should utilize a Web Portal Framework that enables critical web functionality, provides flexibility to customize components, and can scale and change with curricula needs.

Calendar

The portal platform should offer a calendar function such that events can be posted and event registration facilitated.

Content Management System (CMS)

Content is at the heart of your web presence. Managing that content should be easy and intuitive. The Portal should provide you total control of your content. The CMS should allow for easy creation and management of:

- Search Engine Optimization (SEO) – friendly URLs
- Individual page control for:
  - Titles
  - Images
  - Video
  - Keywords and other metadata
- Flexible layout designs for site sections
- Event calendar management

Portal Design

The chosen portal platform should provide you with the professional image and flexibility PPSEP needs. Once site features and functionality are defined, your organization should be able to dictate the site look and feel. The portal platform should allow for configuration of colors, graphics, branding and logos.

Search and Search Engine Optimization (SEO)

Site visitors should be able to find the information they are looking for easily. The portal should include site search capabilities, including the ability to "Search for a Certified Educator in your area."

The portal should provide for easy SEO. Based on the key search terms you need for your web presence, the portal administration should allow for naming of web pages and image alt tags. The site administration tools should allow users to add Meta Keywords and Meta Descriptions.

Secure Site Access – Identity Management

Identity management (IdM) deals with identifying individuals attempting to access the web portal, then controlling access to the resources in the portal by placing restrictions on the established identities of those individuals. The portal should allow for flexibility when assigning user types. At a minimum, the portal should come standard with Anonymous, Registered User, and Administrator user types.

- Anonymous Access – Anonymous site visitors may receive "Read Only" access to site resources without having to enter a user name and password.

- Authenticated Access – Site visitors may gain "Authenticated Access" by entering a valid user account name and password. Once logged in, this user type may have access to site resources not available to anonymous users, such as site administration features. The portal should provide Secure SSL and TLS channels and certificate mapping.

Web Standards and Cross Browser Compatibility

The portal should be developed to the best possible web and mobile standards - emphasizing several key principals: validity, accessibility, cross-browser compatibility, and a clean separation of content and presentation. These principles pave the way for richer Web pages, which are more easily indexed by search engines - and more predictably rendered by browsers.

Electronic Forms

The ability to create and manage forms is a feature that the portal platform should make available. Online forms are necessary tools for collecting information. They can be linked to a database so when data is entered via the web, it is stored for future use. Other forms can be designed to capture data - then send the information via e-mail. Forms may also include features like auto-responders for notifying recipients that their information has been received - or for sending special downloads.

AnalyticsThe portal should include integration with Google Analytics. This will provide insight into website traffic and marketing effectiveness. Powerful, flexible and easy-to-use features let you view and analyze your traffic data, allowing you to develop better-targeted ads, strengthen your marketing initiatives and create higher conversion rates on your Portal.

Challenge-Response Test

A CAPTCHA (Completely Automated Public Turing Test to Tell Computers and Humans Apart) is a challenge-response test used on websites to ensure that the response sent via forms, sign-ups, and comments, are generated by a human - not a computer. A CAPTCHA protects websites against bots by generating and grading tests that humans can pass but current computer programs cannot. The portal should include this feature.

Social Media Integration

Social media is an important means of interacting with your ecosystem – citizens, government agencies, prospective educators and partners. Including social media integration may be a good feature to include in the portal platform. Options should include the ability to post blogs, RSS feeds, and integration with Facebook, Twitter and LinkedIn accounts. This type of integration would allow site visitors to comment on the portal content using their own logins from Disqus, Google, Twitter, Facebook, Yahoo and OpenID.

Video Management

The portal should provide easy management and delivery of rich media, video communication and training. Bringing the power of video to your portal will allow visitors to enjoy the "YouTube" experience on your web site. The portal should offer integration with a Content Delivery Network (CDN) to ensure the delivery of your video content, essentially providing a "private" YouTube for site users.

PROJECT RISKS & CONSTRAINTS

This section categorizes project risk factors that may affect the project, along with the level of threat they pose to the project's success. For instance, a large project carries with it an inherently higher risk. This risk may be reduced if an experienced project manager leads the project. Having many high-risk characteristics does not necessarily mean the project will fail. However, it does mean that a plan must be into place to address each potential high-risk factor, or the project team must attempt to move high-risk characteristics to low-risk wherever possible.

For this feasibility report, we have included only the attributes that would indicate low risk factors, and therefore the desired state. The following tables should be used as guidelines in order to execute a successful project.

Project Scope	Desired / Low-Risk
The scope of the project is:	Well defined & understood
The business requirements of the project are:	Understood and straightforward
The system availability requirements include:	Windows of availability and downtime
Technology platform implementation:	No (or minimal) customization is needed

Schedule	Desired / Low-Risk
Are the project's major milestones and operational dates:	Flexible - may be established by the project team and recipient personnel

Budget	Desired / Low-Risk
The project budget is based upon use of a proven successful cost estimation process used by personnel with estimation experience:	Yes - Proven estimation process with experienced personnel
Project funding matches or exceeds the estimated cost and is stable.	Funding is greater than estimated need and/or is expected to be stable.
After project completion, organization will provide:	Appropriate funding for ongoing portal hosting, management, maintenance

Human Resources	Desired / Low-Risk
The Project Manager's experience and training is:	Recent success in managing projects similar to this one
The experience of project personnel with the tools and techniques to be used:	Are experienced in use of tools and techniques
The project team is:	In the same geographical location
After project completion, organization will have personnel to:	Create new content and keep pertinent content up-to-date
After project completion, organization will institute:	Proper governance around: portal users, portal access, content contributors, content creation, and content approval process

Business/Organizational Impact	Desired / Low-Risk
The project participant(s) providing content knowledge on the project:	Are not required on the project or are very knowledgeable
Business processes, procedures, policies require:	Little or no change
Describe the impact on business procedure, process, or organizational changes as a result of this project:	Either none or only minor changes of procedural, process, or organization
How would you rate the readiness level within the project recipient and stakeholder organizations for changes this project will create?	High readiness (Passionate and enthusiastic)

Technology Platform	Desired / Low-Risk
The technology being utilized consists of:	Mature (Existing software, hardware, languages, databases, and tools)
The technical requirements are:	Similar to others in the organization
The subject matter is:	Well known by the project team
The technology platform is:	Simple and fast to update
Technology interactions/integrations are:	Non-existent, minimal or part of proven system

Technology Partner	Desired / Low-Risk
If a technology platform implementation:	The vendor is familiar with this market
You would rank the technology partner's familiarity with this solution:	Extremely familiar - partner has intimate knowledge of all aspects of the solution and experience with multiple implementations.
Partner has demonstrable success with this solution?	Yes – partner has demonstrable success with other satisfied clients in similar solution application

Senior Leadership Support	Desired / Low-Risk
The project sponsor(s) is:	Identified and enthusiastic – sees long-term project value and is committed to its ongoing support and success

ESTIMATED SOLUTION TIMELINE

The following are estimates only.

Item	Time Period
Phase 1: Requirements Gathering	2 weeks
Phase 2: Development/Customization	6 weeks
Phase 3: Deployment, Stabilization and Release	2 weeks

ESTIMATED SOLUTION PRICING

The following are estimates only.

Item	Cost

○ Requirements Gathering – Features and functionality of the site are defined and agreed upon – Risk are defined and Project Plan is created ○ Development/Customization – Software development and/or software customization takes place – Site features are tested ○ Deployment, Stabilization and Release – Site is moved from “staging” servers to “production” servers – User Acceptance Testing takes place – Site issues (if any are found) are corrected – Site is “released” in “production” (fully functioning and available to users) NOTE: System moves into “Hosting, Support and Maintenance”mode	$40,000 – $50,000

ESTIMATED ONGOING SUPPORT – OPTION A

The following are estimates only.

Item	Cost Monthly
The cost of ongoing support largely depends on the medium used in course creation (multimedia, downloadable PowerPoint with audio, PowerPoint, PDF or Word document). In this option A, we have estimated ongoing support based on the courseware being **multimedia** (including audio, video, presentation). While multimedia online curriculum will be **more effective** and provide a **better user experience** for learners, multimedia also necessitates the integration of a CDN, and larger media file sizes – affecting bandwidth necessary for online delivery, and the amount of necessary file storage. **Note:** If system were to be shared by several states, the cost of on-going support could become a shared expense. **Support should include:** ○ Hosting ○ Content Delivery Network (CDN) Integration ○ Maintenance and Storage ○ Back-up and Recovery ○ 800 Help Desk Service	$1,500 – $3,500

ESTIMATED ONGOING SUPPORT – OPTION B

The following are estimates only.

Item	Cost Monthly
The cost of ongoing support largely depends on the medium used in course creation (multimedia, downloadable PowerPoint with audio, PowerPoint, PDF or Word document). In this option B, we have estimated ongoing support based on the courseware being a downloadable file such as PowerPoint, PDF or Word document. Delivering course content as a downloadable file will be less effective (in terms of learner absorption of material presented) and will not deliver the high quality user experience like multimedia. Ongoing expense for this option is less because this approach does not require integration of a CDN, and media file sizes will be smaller – requiring less bandwidth and less media storage. **Support should include:** ○ Hosting ○ Maintenance and Storage ○ Back-up and Recovery ○ 800 Help Desk Service	$500 – $1,000

SUMMARY – ONLINE LEARNING PORTAL FEASIBILITY

An online learning portal would allow the Pipeline Safety Coalition and/or other administrator of PPSEP, to very effectively create, manage, deliver and measure information, orientation, and training in PPSEP. It would provide online certification to users in Pennsylvania, but be scalable and flexible enough to deliver state-specific educational content and certification to users anywhere in the United States. With the right features and processes, the web portal could provide the tools for proactive, continuous improvement of the learning portal.

Ultimately, the success of an online approach to training and certification will depend on having sufficient resources in place for the project. Key resources for project success include, but are not limited to the following:

- Project funding – for development and ongoing support of the learning portal once it is online
- Proper choice of a technology partner – a company who has successfully done this before
- Resources for course creation – educators who can do the initial creation and can update content when necessary
- Resources to maintain the web portal – while the appropriate technology will make the website easy to maintain, someone will need to be responsible for ongoing care and feeding

There is no more important mission than helping to ensure that our communities are safe. We believe that there is no better way to offer **Pipeline Procedure and Safety Educator** certification than through an online learning portal. With the right tools and the proper curriculum, online learning can produce great results by decreasing overall costs of training, improving the efficiency and timeliness of content delivery, and increasing the retention and therefore the effectiveness of certified educators.

APPENDIX A – ONLINE LEARNING ADVANTAGES & CONSIDERATIONS

Improved Training Costs – Producing learning content is time consuming whether it is online or not. With eLearning, each time the course is accessed your return on investment improves because you are dividing the fixed production costs by number of uses. You also have savings through decreased travel, reduced material, and hopefully improved (and more efficient) performance of those trained.

Cost Reduction

Facility and audio/video equipment rental costs, travel and hotel expenses, and meals and refreshments for attendees all add up. In addition, consider the value of the time lost to the attendees and to your organization as attendees travel to and from training sessions. Online registration and web delivery is very inexpensive, and allow your attendees to participate from any location with an Internet connection.

Availability, Flexibility and Agility

Online training is available around the clock, so people can fit the training into their own schedules rather than having to block out time to attend a training class. With online training, learners can study when they want and at the pace they need. Training is always available and the learner can stop when needed, and then pick up where they left off.

Effectiveness

Most learners do not retain the majority of the training delivered in the classroom. Online training allows the learner to revisit the training when they need to. Online training can give learners the comfort of asking questions without feeling awkward. This confidence helps learners. Virtual classrooms foster an environment where users enjoy a high success rate.

Evaluation and Measurement

Online training leverages the latest technology to deliver training to, assess and certify learners. It provides program administrators with real-time reporting. Learners can receive feedback during the curriculum presented, or at the end of course material. Administrators will know who completed training, when and where. From a legal perspective, compliance is easily measured and proven.

Improved Retention – The combination of rich media and video can produce a rich, self-paced learning experience that is repeatable. Add good practice activities with feedback and you have a learning environment that is going to help your learners retain the course content – and the use of audio, video, animation and text means users learn using the learning style or styles they most prefer.

Consistency

When counting on live trainers, there is simply no way to ensure consistency of the message being delivered. This becomes especially important when safety or legal issues arise. Online learning allows you to create a standardized process and consistency in the delivery of content. It also compresses delivery time.

Version Control

Videotape, CD's and DVD's – all are expensive to duplicate and ship. Often times, there is no way to be sure that the media arrived, and no way to know if your learners are using the most recent version of the training. Online training saves the cost associated with media duplication and shipping, and learners have no choice but to use the most recent version of the training.

Shorter Time Frame
In-person training must include time for breaks, lunch, and the time needed to get to classes. With live training, the class can move only as fast as the slowest learner, quicker students lose interest and absorb less. With online training, more time is spent focused on training objectives.

Expand Reach
When your training is live, your audience reach is very often not what you would desire. Potential attendees cannot be away from their jobs. For others it is simply inconvenient to attend, particularly if the training site is not centrally located to them. When you make your education program virtual, your potential audience suddenly becomes worldwide. Someone across the country can attend for the same cost and time as someone in the next room. Learners do not have to wait for a class, they can access the training when and where they like.

React Quickly
When laws or regulations change, a crisis erupts, or a new procedure must be rolled out, time is of the essence. The time lost in planning to get your constituents together for live training can cost your organization, and the community, dearly. Having a virtual system at the ready for these communications can allow your organization to react quickly, virtually instantly. Arm your learners with the knowledge they need to make them the best trained and up-to-date in their industry.

Integrate Technology-Based Learning into Business Processes
Utilizing the latest in technology shows your constituents that you are up-to-date and forward thinking. Your audience, particularly those who are of younger generations, will be looking to affiliate with associations and organizations that utilize the full benefits of technology. Your audience will appreciate the ease with which they will be able to obtain training, education and certification and the time online methods will save.

Increase Time-to-Competency
Utilizing virtual training and education methods allows you to schedule updates on-demand, and more frequently if needed. Frequent, timely information will increase the overall competency of your learners, making them experts in their field and helping to increase the quality and accuracy of the information they deliver.

Increase Collaboration and Interaction
Today's online tools allow for collaboration through polling, chatting, and other feedback mechanisms. For online programs that incorporate feedback, system users are 60 percent more likely to provide honest feedback, than in a live classroom setting. Know what your online users think about the experience and use that feedback to continuously improve your program.

Knowledge Management - The foundation of a learning community is built on sharing what you know with others. This is where incorporating a forum or wiki adds value to your online learning. Sharing of resources and insight gained from the courses can be encouraged.

Online Learning is good for the Environment - Britain's Open University's "study found that producing and providing distance learning courses consumes an average of 90% less energy and produces 85% fewer CO2 emissions per student than conventional face-to-face courses."

SUMMARY
Universal access to unbiased, factual education through educators is essential in crafting a safer future through informed communities who are able to fully participate in official proceedings pertaining to pipeline safety issues. The Project realized that providing equal access to educational opportunities in the vast geography of Pennsylvania was a challenge and sought to remedy that obstacle with internet based education of educators verified for reliability.

Vetting curriculum through geographically and sociologically based renditions of "What You Need to Know and Why" confirmed its use as a standard upon which to base syllabus. Education of local, state and federal regulatory agency standards are cursory, but essential. Citizens want to know "Just the Facts." From those facts they are able determine what more they need to learn, and capable of making more informed decisions. The basics of "What You Need to Know" is what educators need to be familiar with when approaching an audience new to pipeline safety and siting.

Streamlining the PPSEP website to educate though links to educational resources and then redirect the student back to the mainframe for competency keeps the program active and engaging as was proven through the Accreditation Council for Continuing Medical Education. Syllabus and testing remain current in scope through links to state and federal websites which will best ensure timely updates to regulatory changes. PPSEP programing will accommodate for those regulatory and informational changes by triggering web portal administrative updates to exam formats. Mainframe and maintenance costs, by nature, remain low.

The Project has researched and defined a curriculum for training educators to be used initially in Pennsylvania and to be transferable to other states. The Project utilized consulting and partnerships with the defined core demographic and expanded that demographic to the tristate area and internationally. The Project feasibility study of virtual course delivery addressed a verifiable system of grading to create a checks and balance system for education reliability. Templates of programs were created in 17 venues and are provided by internet access at www.pscoalition.org

The Project has maintain open communications between local operators, local communities and other interested parties and has proactively participated in and encouraged early and informed involvement of all stakeholders in official proceedings pertaining to pipeline safety issues so as to strengthen the depth and quality of public participation in pipeline safety matters.

As means of self evaluation, the Project makes the following observations and recommendations:

Observations and Recommendations:
1. Funding to implement PPSEP should be investigated and obtained with the same swift urgency as regulatory changes have occurred in Pennsylvania.
2. PPSEP should be created and initiated in Pennsylvania, and made available in 2013 by utilizing work product of this Project.

3. To assure program accuracy PPSEP should be primarily administered by PHMSA. In Pennsylvania, the program should be administered in partnership with PA PUC and PSC. Partnership between federal, State agencies and a PA Non Profit ensures community outreach and participation.
4. A pilot program of PPSEP in partnership with the Pittsburgh Local Government Academy and its 24 county membership should be sought, vetted and initiated immediately.
5. As a national program PPSEP partnership should be sought from Pipeline Safety Trust.
6. The Project probed the creation of a Memorandum of Understanding (MOU) with the entities linked to the course. Success of a MOU is tied directly to the authoritative entity. As such we reiterate the primary administrative authority of PPSEP to be PHMSA and recommend creation of a MOU for the benefits of:
   a. Annual curriculum review for accuracy
   b. Cooperative agency efforts over time
   c. Encouragement of PIPA recommendations in cooperative communication among stakeholders
   d. Continuing engagement of entities in pipeline safety education
7. In all curriculum syllabus, emphasis should be placed on education specific to land use planning education and PIPA. Educators may also provide programs specific to municipalities and elected officials regarding PIPA recommendations.
8. Pennsylvania farmers are arguably the large segment of affected land owners in Marcellus Shale development. A subjective difference exists in their safety requirements that merits close reconsideration. Currently, Pennsylvania farmers are exempt from the requirement to notify One Call if they are disturbing land for agricultural purposes, no deeper than 18 inches. As any farm will attest, depth is subjective. Production agriculture, for example, may use no till cover crop practices with little to no earth disturbance. Alternatively, heavy till practices required varying depths of earth disturbance. Soil erosion and sediment control vary with farm practices, type of operation, drought and flood conditions. Erosion alone is a profound variable when determining whether an 18 inch depth today is equivalent to 18 inches two, three or 50 years ago when pipelines were laid. Additionally, farming communities are increasing found in urban areas where historic pipeline infrastructure may not be known on farmland. In the expansive development of gas throughout the nation, increasingly, uniformed farmers pose significant safety risks to themselves, the public and the environment. And yet, Texas, is the only state that provides cost free safety education to farmers. Providing pipeline safety education to farming communities will reduce the risk of farming accidents. The Project recommends creating programs specific to the farming community that take into consideration the diversity of urban, suburban and rural farming and incorporating the farmer trusted entity FarmAid in those efforts. Not only does Farm Aid reach millions of American and international farmers, the hard earned trust of the farming community has been earned by Farm Aid, further providing an open audience to pipeline safety.
9. The Project had not identified the complex issue of application, permitting and construction techniques of water crossings in educational needs. The Project learned over time numbers of potential pipeline crossings of waters in Pennyslvania's tri-state area, and the potential for learning needed. For example, seventeen counties in the Delaware River Basin are impacted

by existing pipeline and new infrastructure. Increasing concerns regarding this knowledge base were presented late in vetting curriculum. The Project recommends curriculum and syllabus inclusive of water crossing protocol by state and federal regulations specific to pipeline construction. In the Pennsylvania tri-state area program components should be inclusive to SPW designated areas of the Delaware River Water Basin. Entities to consider for expertise include but are not limited to: Delaware River Basin Commission (DRBC), Delaware RiverKeeper Network, Mountain Watershed Association, Susquehanna River Basin Commission

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APPENDIX A:
Ecological Society of America: Pipeline Safety Coalition Abstract #33840
Before the advent of Marcellus Shale natural gas in Pennsylvania, 60,418 miles of gas and oil pipelines crisscrossed a 46,055 square mile landscape. Marcellus Shale has spawned 2,974 Pennsylvania gas wells; requisite pipeline infrastructure development is evolving. 7,388 well permits wells/prerequisite pipeline infrastructure are pending. Pipeline infrastructure includes gathering lines, compressor stations, transmission lines and distribution lines. Well pads on average occupy 3.1 acres, road, water impoundments and pipeline infrastructure takes an additional 5.7 acres. Nature Conservancy estimates 60,000 new wells will be drilled in Pennsylvania by 2030, requiring 25,000 additional miles of pipelines, resulting in a statewide web of 85,000+ miles of pipeline within 46,055 square miles. Further, Pennsylvania's existing pipeline infrastructure is one of the nation's oldest, threatening public/environmental safety: January 18, 2011: aging Philadelphia gas main exploded killing one; injuring six people. February10, 2011: aging Allentown gas line exploded leaving five dead; destroying eight homes. According to the Federal Pipeline and Hazardous Materials Safety Administration, 2,800+ significant gas pipeline incidents occurred nationally since 1990, injuring or killing 1,000+ people. 2010-2011: an annual record number of fifty natural gas pipeline explosions left seventeen dead in a five month period alone. Concurrence of need for extensive new pipeline infrastructure to support Pennsylvania Marcellus Shale and need to replace dangerously aging pipeline infrastructure heightened public awareness, creating a unique opportunity to engage grassroots to industry stakeholders in development of an infrastructure that begins with environmental/public safety. "Education is the foundation upon which we build our

future." (Washington State Governor Christine Gregoire) Creating informed communities in this era of natural gas development is crucial to the foundation of a safe future.
"Educating the Educators: Pipeline Procedure and Safety Education Program" addressed the need to provide timely, universal access to unbiased/factual pipeline safety education. Initiated in Pennsylvania, where pipeline failures pose significant risk to people and unusually sensitive environmental areas, the project created a core curriculum to train educators by virtual delivery and verifiable grading system for education reliability. Added verified educators of pipeline procedure/ safety increases availability/dissemination of unbiased/factual information to the public; informed communities are safer communities. Through education, control of recognized hazards of pipeline infrastructure is initiated. Acceptable levels of risk, protection of people, possessions and environment are strengthened through equal participation by the public in pipeline safety proceedings. The course is transferable to all states.