



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Request for Quotation

RFQ NUMBER
EDD346530

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF
SHELLY MURRAY 304-558-8801

VENDOR

Attn: Silvio Baretta
 World Class Industrial Network
 33 Terminal Way Suite 435
 Pittsburgh PA 15219

SHIP TO

DEPARTMENT OF EDUCATION
 BUILDING 6
 1900 KANAWHA BOULEVARD, EAST
 CHARLESTON, WV
 25305-0330

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
10/27/2010				

BID OPENING DATE: 12/02/2010 BID OPENING TIME 01:30PM

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	LS		952-90		
<p>THE WEST VIRGINIA PURCHASING DIVISION, FOR THE AGENCY, THE WEST VIRGINIA DEPARTMENT OF EDUCATION, IS SOLICITING BIDS TO PERFORM A STUDY OF THE EDUCATIONAL NEEDS RELATING TO THE NEW EMERGING INDUSTRY OF NATURAL RESOURCE PRODUCTION RELATING TO MARCELLUS SHALE EXTRACTION PER THE ATTACHED SPECIFICATIONS.</p> <p>TECHNICAL QUESTIONS MUST BE SUBMITTED IN WRITING TO SHELLY MURRAY IN THE WEST VIRGINIA PURCHASING DIVISION VIA MAIL AT THE ADDRESS SHOWN AT THE TOP OF THIS RFQ, VIA FAX AT 304-558-4115, OR VIA E-MAIL AT SHELLY.L.MURRAY@WV.GOV. DEADLINE FOR ALL TECHNICAL QUESTIONS IS 11/16/2010 AT THE CLOSE OF BUSINESS. ALL TECHNICAL QUESTIONS RECEIVED, IF ANY, WILL BE ADDRESSED BY ADDENDUM AFTER THE DEADLINE.</p> <p style="text-align: right;">2010 NOV 24 AM 11:40 WV PURCHASING DIVISION</p> <p>EDUCATIONAL NEEDS RELATING TO MARCELLUS SHALE</p> <p>EXHIBIT 3</p> <p>LIFE OF CONTRACT: THIS CONTRACT BECOMES EFFECTIVE UPON AWARD AND EXTENDS FOR A PERIOD OF ONE (1) YEAR OR UNTIL SUCH "REASONABLE TIME" THEREAFTER AS IS NECESSARY TO OBTAIN A NEW CONTRACT OR RENEW THE ORIGINAL CONTRACT. THE "REASONABLE TIME" PERIOD SHALL NOT EXCEED TWELVE (12) MONTHS. DURING THIS "REASONABLE TIME" THE VENDOR MAY TERMINATE THIS CONTRACT FOR ANY REASON UPON GIVING THE DIRECTOR OF PURCHASING 30 DAYS WRITTEN NOTICE.</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE	TELEPHONE	DATE
Silvio R. Duncan Baretta	412-325-1565, X 29	11/23/2010
TITLE	FEIN	ADDRESS CHANGES TO BE NOTED ABOVE
SENIOR PARTNER	083	

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

GENERAL TERMS & CONDITIONS
REQUEST FOR QUOTATION (RFQ) AND REQUEST FOR PROPOSAL (RFP)

1. Awards will be made in the best interest of the State of West Virginia.
2. The State may accept or reject in part, or in whole, any bid.
3. Prior to any award, the apparent successful vendor must be properly registered with the Purchasing Division and have paid the required \$125 fee.
4. All services performed or goods delivered under State Purchase Order/Contracts are to be continued for the term of the Purchase Order/Contracts, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise available for these services or goods this Purchase Order/Contract becomes void and of no effect after June 30.
5. Payment may only be made after the delivery and acceptance of goods or services.
6. Interest may be paid for late payment in accordance with the *West Virginia Code*.
7. Vendor preference will be granted upon written request in accordance with the *West Virginia Code*.
8. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.
9. The Director of Purchasing may cancel any Purchase Order/Contract upon 30 days written notice to the seller.
10. The laws of the State of West Virginia and the *Legislative Rules* of the Purchasing Division shall govern the purchasing process.
11. Any reference to automatic renewal is hereby deleted. The Contract may be renewed only upon mutual written agreement of the parties.
12. **BANKRUPTCY:** In the event the vendor/contractor files for bankruptcy protection, the State may deem this contract null and void, and terminate such contract without further order.
13. **HIPAA BUSINESS ASSOCIATE ADDENDUM:** The West Virginia State Government HIPAA Business Associate Addendum (BAA), approved by the Attorney General, is available online at www.state.wv.us/admin/purchase/vrc/hipaa.htm and is hereby made part of the agreement. Provided that the Agency meets the definition of a Cover Entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the vendor.
14. **CONFIDENTIALITY:** The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures, and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/noticeConfidentiality.pdf>.
15. **LICENSING:** Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, and the West Virginia Insurance Commission. The vendor must provide all necessary releases to obtain information to enable the director or spending unit to verify that the vendor is licensed and in good standing with the above entities.
16. **ANTITRUST:** In submitting a bid to any agency for the State of West Virginia, the bidder offers and agrees that if the bid is accepted the bidder will convey, sell, assign or transfer to the State of West Virginia all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the State of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the State of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to the bidder.

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership, or person or entity submitting a bid for the same material, supplies, equipment or services and is in all respects fair and without collusion or Fraud. I further certify that I am authorized to sign the certification on behalf of the bidder or this bid.

INSTRUCTIONS TO BIDDERS

1. Use the quotation forms provided by the Purchasing Division. Complete all sections of the quotation form.
2. Items offered must be in compliance with the specifications. Any deviation from the specifications must be clearly indicated by the bidder. Alternates offered by the bidder as **EQUAL** to the specifications must be clearly defined. A bidder offering an alternate should attach complete specifications and literature to the bid. The Purchasing Division may waive minor deviations to specifications.
3. Unit prices shall prevail in case of discrepancy. All quotations are considered F.O.B. destination unless alternate shipping terms are clearly identified in the quotation.
4. All quotations must be delivered by the bidder to the office listed below prior to the date and time of the bid opening. Failure of the bidder to deliver the quotations on time will result in bid disqualifications: Department of Administration, Purchasing Division, 2019 Washington Street East, P.O. Box 50130, Charleston, WV 25305-0130
5. Communication during the solicitation, bid, evaluation or award periods, except through the Purchasing Division, is strictly prohibited (W.Va. C.S.R. §148-1-6.6).



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2

ADDRESS CORRESPONDENCE TO ATTENTION OF
**SHELLY MURRAY
 304-558-8801**

RFQ COPY

TYPE NAME/ADDRESS HERE

ATTN: SILVIO BARETTA
 WORLD CLASS INDUSTRIAL NETWORK
 33 TERMINAL WAY SUITE 435
 PITTSBURGH PA 15219

DEPARTMENT OF EDUCATION

BUILDING 6
 1900 KANAWHA BOULEVARD, EAST
 CHARLESTON, WV
 25305-0330

DATE PRINTED 10/27/2010	TERMS OF SALE	SHIP VIA	FOB	FREIGHT TERMS
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BID OPENING DATE: **12/02/2010** BID OPENING TIME **01:30PM**

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
<p>UNLESS SPECIFIC PROVISIONS ARE STIPULATED ELSEWHERE IN THIS CONTRACT DOCUMENT, THE TERMS, CONDITIONS AND PRICING SET HEREIN ARE FIRM FOR THE LIFE OF THE CONTRACT.</p> <p>RENEWAL: THIS CONTRACT MAY BE RENEWED UPON THE MUTUAL WRITTEN CONSENT OF THE SPENDING UNIT AND VENDOR, SUBMITTED TO THE DIRECTOR OF PURCHASING THIRTY (30) DAYS PRIOR TO THE EXPIRATION DATE. SUCH RENEWAL SHALL BE IN ACCORDANCE WITH THE TERMS AND CONDITIONS OF THE ORIGINAL CONTRACT AND SHALL BE LIMITED TO TWO (2) ONE (1) YEAR PERIODS.</p> <p>CANCELLATION: THE DIRECTOR OF PURCHASING RESERVES THE RIGHT TO CANCEL THIS CONTRACT IMMEDIATELY UPON WRITTEN NOTICE TO THE VENDOR IF THE COMMODITIES AND/OR SERVICES SUPPLIED ARE OF AN INFERIOR QUALITY OR DO NOT CONFORM TO THE SPECIFICATIONS OF THE BID AND CONTRACT HEREIN.</p> <p>OPEN MARKET CLAUSE: THE DIRECTOR OF PURCHASING MAY AUTHORIZE A SPENDING UNIT TO PURCHASE ON THE OPEN MARKET, WITHOUT THE FILING OF A REQUISITION OR COST ESTIMATE, ITEMS SPECIFIED ON THIS CONTRACT FOR IMMEDIATE DELIVERY IN EMERGENCIES DUE TO UNFORESEEN CAUSES (INCLUDING BUT NOT LIMITED TO DELAYS IN TRANSPORTATION OR AN UNANTICIPATED INCREASE IN THE VOLUME OF WORK.)</p> <p>BANKRUPTCY: IN THE EVENT THE VENDOR/CONTRACTOR FILES FOR BANKRUPTCY PROTECTION, THE STATE MAY DEEM THE CONTRACT NULL AND VOID, AND TERMINATE SUCH CONTRACT WITHOUT FURTHER ORDER.</p> <p>THE TERMS AND CONDITIONS CONTAINED IN THIS CONTRACT SHALL SUPERSEDE ANY AND ALL SUBSEQUENT TERMS AND CONDITIONS WHICH MAY APPEAR ON ANY ATTACHED PRINTED</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE Silvio R. Duncan Barett	TELEPHONE 412-325-1565, x29	DATE 11/23/2010
TITLE SENIOR PARTNER	FEIN 083	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'



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304-558-8801

RFQ COPY

TYPE NAME/ADDRESS HERE

SILVIO BARETTA
WORLD CLASS INDUSTRIAL NETWORK
33 TERMINAL WAY SUITE 435
PITTSBURGH PA 15219

DEPARTMENT OF EDUCATION

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<p>DOCUMENTS SUCH AS PRICE LISTS, ORDER FORMS, SALES AGREEMENTS OR MAINTENANCE AGREEMENTS, INCLUDING ANY ELECTRONIC MEDIUM SUCH AS CD-ROM.</p> <p>NOTICE</p> <p>A SIGNED BID MUST BE SUBMITTED TO:</p> <p>DEPARTMENT OF ADMINISTRATION PURCHASING DIVISION BUILDING 15 2019 WASHINGTON STREET, EAST CHARLESTON, WV 25305-0130</p> <p>THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:</p> <p>SEALED BID</p> <p>BUYER: SHELLY MURRAY</p> <p>RFQ. NO.: EDD346530</p> <p>BID OPENING DATE: 12/02/2010</p> <p>BID OPENING TIME: 1:30 PM</p> <p>PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY TO CONTACT YOU REGARDING YOUR BID: 412-325-1572</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE Silvio R. Dunian Barett	TELEPHONE 412-325-1565, X29	DATE 11/23/2010
TITLE SENIOR PARTNER	FAX 083	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'



State of West Virginia
 Department of Administration
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Request for Quotation

RFQ NUMBER:
EDD346530

PAGE:
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ADDRESS CORRESPONDENCE TO ATTENTION OF:
**SHELLY MURRAY
 304-558-8801**

RFQ COPY

TYPE NAME/ADDRESS HERE
**ATTN: SILVIO BARETTA
 WORLD CLASS INDUSTRIAL NETWORK
 33 TERMINAL WAY SUITE 435
 PITTSBURGH PA 15219**

SHIP TO

**DEPARTMENT OF EDUCATION
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10/27/2010				

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LINE	QUANTITY	UOP	CAT. NO.	ITEM NUMBER	UNIT PRICE	AMOUNT

CONTACT PERSON (PLEASE PRINT CLEARLY):						

SILVIO BARETTA WORLD CLASS INDUSTRIAL NETWORK 33 TERMINAL WAY SUITE 435 PITTSBURGH, PA 15219 PHONE: 412-325-1565, EXT. 29						
***** THIS IS THE END OF RFQ EDD346530					***** TOTAL: <u>\$50,000</u>	
					EMAIL: silvio@winnets.com EMAIL: silvio@winnets.com	

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE Silvio R. Duncan Barett	TELEPHONE 412-325-1565, X29	DATE 11/23/2010
TITLE SENIOR PARTNER	FEIN 083	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

Request for Quote EDD346530

Developing a System of Training and Educational Support for the West Virginia Oil & Gas Industry

The West Virginia Department of Education, Division of Technical, Adult and Institutional Education, Office of Career and Technical Instruction supervises the delivery of secondary and adult career and technical education programming in middle schools, high schools and technical centers throughout West Virginia. This office wishes to purchase the services of a researcher or research company to develop an analysis of anticipated job growth in the West Virginia gas industry associated with the development of the Marcellus Shale. The goal of the analysis is to provide the WVDE with a breakdown of high-demand occupations and of the skills required by these occupations, in order to take proactive steps designed to align the training and educational system with the emerging demand.

The WVDE will purchase research services that generate the following outcomes:

1. An examination of the natural gas job opportunities generated by the development of the Marcellus Shale in West Virginia, with a special focus on identifying occupations in demand and identifying the geographic regions of anticipated drilling;
2. Timeline for job growth, i.e., anticipated growth by occupation for the next 3-5 years;
3. Skill sets required for anticipated jobs;
4. Specific recommendations to WVDE regarding the creation or reformulation of existing education and/or training programs with the purpose of supporting the growth of the state's natural gas industry.

Deliverables – Vendor will deliver:

1. Research results in electronic and paper formats.

Terms and Conditions of the Contract

The purchase order for this contract will be issued to the low bidder who meets the qualifications. The successful bidder will be notified by purchase order from the West Virginia Purchasing Division.

Vendor Qualifications

Qualified bidders must meet the following criteria:

1. Organizations bidding on this project must have conducted a prior study of the Marcellus Shale (located in the Appalachian region) within the last three years. The previous study must have included in scope, development of job projections in the context of the Marcellus Shale.
2. Organizations bidding on this project must have prior experience working with state and/or local agencies involved with workforce development.

Cost Sheet

	Tasks	Quality	Total
<p>Outcome 1- Generate a report of natural gas job opportunities, including geographic regions of anticipated drilling and occupations needed.</p>	<ul style="list-style-type: none"> ● Collect data on number of Marcellus Shale permits issued in the state, per year, 2009-2010 ● Develop projections for occupations in demand. Interview companies (5-10) to ascertain <ul style="list-style-type: none"> ○ Number of Marcellus Shale (MS) rigs deployed in the state, numbers projected for 2011-2014 ○ Number of anticipated wells ○ Total number of gas wells today and anticipated (2011-2014) – how MS activities “fit” into the overall company activities within the industry ○ Where drilling is taking place, and where it is anticipated (by County or groups of Counties, as appropriate) ○ Key occupations needed; major challenges faced in finding workers ○ Check systematically the occupational classification used to estimate job demand, and the numerical “ratio” of jobs and skills needed to drill one well ○ Skills needed – do available skills “fit” with the available jobs? ● Review of company annual reports, reports to investors, press releases (to ascertain company drilling plans) – Perform broad online survey covering key companies in the oil & gas supply chain to collect extensive data on drilling plans, labor force needs. The survey is not conceived as a “scientific” survey designed to generate workforce demand – the latter will be derived from the amount of drilling taking place in the state. Rather the survey is to be used as one more set of data points to check and supplement the information collected during the in-depth interviews and other research. 	1	\$ 33,000.00

Cost Sheet (Cont.)

	Tasks	Quality	Total
Outcome 2 – Timeline for job growth by occupation	<ul style="list-style-type: none"> • Group occupations in major categories – pre-drilling phase, drilling, post-drilling • Within each group, highlight occupations most in demand • Develop timeline for each major occupational category, and for the major specific occupations in demand 	1	\$ 3,500.00
Outcome 3 – Skill sets required for anticipated jobs	<ul style="list-style-type: none"> • Code occupations most in demand into the Standard Occupational Classification (SOC) categories • Map SOC categories into the Federal Government 's O*Net database • On the basis of O*Net develop list of skill sets required for each occupation 	1	\$ 3,500.00
Outcome 4 – Recommendations	<ul style="list-style-type: none"> • Develop specific recommendations to WVDE regarding the creation or reformulation of existing education and/or training programs with the purpose of supporting the growth of the state's natural gas industry. 	1	\$ 10,000.00
TOTAL			\$50,000.00

**DEVELOPING A SYSTEM OF TRAINING AND EDUCATIONAL SUPPORT
FOR THE WEST VIRGINIA OIL & GAS INDUSTRY
RESPONSE TO THE REQUEST FOR QUOTE EDD346530**

World Class Industrial Network, LLC (“WIN”), and its sub-contractor, Penn Technical College (“PennTech”), respectfully submit the following proposal to the West Virginia Purchasing Division, which is operating on behalf of the West Virginia Department of Education (“WVDoE”). This is a response to the Request for Quote (RFQ) EDD346530 on educational and training needs relating to the Marcellus Shale.

WIN understands that the major purpose of the analysis solicited by the WVDoE is to take proactive steps to align the training and educational system with the emerging workforce demand in the state’s oil and gas industry associated with the growth of the Marcellus Shale. Specifically, WVDoE wishes the vendor to develop projections for occupations most in demand within the oil and gas industry for the next 3 to 5 years, outline the skills required by these occupations, and make recommendations to the WVDoE on how to align the educational and training system to these changing occupational needs.

In what follows, WIN will briefly describe its qualifications to perform this analysis as outlined, and those of PennTech; will submit a work plan designed to produce the requested outcomes; and will present a budget for the work.

Vendor Qualifications

Prior Experience in Workforce Development

WIN has a vast experience in the field of workforce development. In the past 15 years WIN has become the premier company in the industry in Southwestern Pennsylvania, counting among its clients government (prominently the Commonwealth of Pennsylvania), non-profit organizations, foundations, colleges and universities. Among WIN’s clients a few are worth mentioning.

- For nearly two decades WIN has assisted Duquesne University’s John F. Donohue Graduate School of Business in the development of executive programs, training and research around Southwestern Pennsylvania’s skilled workforce, and community development projects.
- WIN developed and currently manages New Century Careers, a non-profit workforce development intermediary that has become the largest provider of new, entry-level machinists to Southwestern Pennsylvania’s manufacturing industry. In partnership with over 200 firms doing precision jobs for the medical, nuclear and defense industries, and with the support of foundations and the Commonwealth of Pennsylvania, New Century

Careers has recruited, trained and placed over 1,000 individuals in the industry during the past ten years.

- Under contract with the Southwest Corner, Westmoreland and Fayette, and Three Rivers Workforce Investment Boards, WIN manages various industry partnerships funded by Pennsylvania's Industry Partnership ("IP") program. The IP initiative aims at making Pennsylvania's industry more competitive by promoting joint action of companies in issues of common interest. Workforce is the central focus of the program -- recruitment, training, placement and retention of new employees and the upgrading of the skills of incumbent workers. Prominent among the partnerships managed by WIN is the one targeting Southwestern Pennsylvania's Oil and Gas Industry.

WIN's professional practice also includes an information technology component developing customized software systems for private companies and government to manage customers, staff or even entire operations. WIN works on the base of existing platforms, such as Salesforce. Key clients include the state of Pennsylvania and private companies. Among the latter clients, a project worth mentioning is the implementation of an Enterprise Resource Planning ("ERP") system for Hamill Manufacturing.

Prior Experience with Job Projections Relating to the Marcellus Shale

Regarding specific experience with job projections in the context of the Marcellus Shale, WIN's association with PennTech has created a team that is fully capable of performing the tasks listed in WVDoe's Request for Quote. As observed above, WIN manages the Southwestern Pennsylvania Oil and Gas Partnership. As part of the Partnership's work program in 2009-2010, WIN and PennTech have worked jointly to develop occupational projections for the Southwestern Pennsylvania portion of the Marcellus Shale. The model used was the one pioneered by PennTech in its original 2009 study that projected occupational demand for the areas of the Northern Tier and Central Workforce Investment Boards in Pennsylvania.¹ As elaborated below, this approach parts company with the econometric models generally employed to develop occupational projections. The approach has been created to respond to the specific conditions of drilling in the Marcellus Shale, and to the occupational profile associated with these

¹ See Marcellus Shale Education and Training Center, Marcellus Shale Workforce Needs Assessment (Northcentral PA). Pennsylvania Technical College, June 2009. See also Marcellus Shale Education and Training Center, Marcellus Shale Workforce Needs Assessment, Southwest Pennsylvania. Pennsylvania Technical College, June 2010. The latter study is appended to the attachments to our response to this Request for Quote; it can also be found online at www.pct.edu/msetc/.

conditions. The model we used in the Southwest Pennsylvania Oil and Gas Industry Partnership is currently being applied to create occupational estimates for the Commonwealth of Pennsylvania in its entirety (i.e., for the total area of the Marcellus Shale encompassed by Pennsylvania).

Work Plan

The work plan will address specifically the outcomes listed in the Request for Proposals.

Prior to discussing the plan, a preliminary comment is necessary regarding the methodology pursued by WIN and PennTech. The approach proposed below shies away from standard input-output econometric models, in which employment by industry and occupation is a function of the amount and kinds of goods and services sold. This, in turn, determines the labor requirements of the economy. These models usually rely on national average figures applied to local industries. These averages fail to capture the sudden growth in local demand for goods and services as well as labor, and the supply chains that quickly develop under the fast growth conditions introduced by a boom in gas exploration and production. As an alternative, WIN and PennTech propose to estimate occupational demand directly as a function of the number of wells drilled and pipeline and infrastructure built. Data on drilling and infrastructure development are empirically derived from interviews with companies, surveys and published documents.

The work plan presented below contemplates a series of steps designed to achieve the outcomes listed in the Request for Quote.

Step 1 will “generate a report of natural gas job opportunities, including geographic regions of anticipated drilling and occupations needed” (Outcome #1). The approach starts by customizing an occupational matrix for Marcellus Shale activities to the specific context of West Virginia. The matrix is a comprehensive list of occupations produced via intensive interviews with companies involved in Marcellus Shale drilling and gas well operations. Because of regional variations in several factors (such as the characteristics of the gas extracted and the thickness of the Shale), the occupational mix associated with the Marcellus Shale varies somewhat from place to place. The initial task is then to make sure that the matrix encompasses all the occupations relevant to drilling and operating a gas well in West Virginia’s Marcellus Shale. We will also check the possibility that significant variations may occur within the state.

Once the occupational framework is solidly established, the next task will consist of ascertaining the “amount” of labor needed to drill a well or build a mile of pipeline. A series of in-depth interviews with key companies (5 to 10) and an online survey will be the key tools to collect this information. The data will then be converted to full-time equivalent requirements. (For instance, drilling of one well

may call for 7.22 working days or 57.76 working hours of a drilling engineer. This is the approximate equivalent of 3% or 0.03 of the available hours of a full-time engineer.) Once full-time equivalent requirements are obtained for each occupation, projecting the total labor needs by occupation is a matter of multiplying the figures for one well by the projected number of wells (or by miles of pipeline in the case of infrastructure development). Numbers of projected wells for 2010 and beyond will be derived from the interviews, the survey and from documents such as company annual reports.

This methodology will enable us to determine the projected future need by occupation. Additional topics to be investigated using several sources (the interviews and the online survey, data from the West Virginia Office of Oil & Gas and the West Virginia Geological and Economic Survey, published reports and documents) include among others:

- Marcellus Shale permits issued in West Virginia, 2008-2010
- Number of rigs deployed in the state by company (note that information on the number of rigs serves to check figures on the number of wells projected by the various firms)
- Geographic location of anticipated drilling
- General workforce issues, such as the challenges faced in finding and training workers
- General issues facing the industry (issues providing a context for their projections and drilling plans)

Step 2 will generate a “timeline for job growth by occupation” (Outcome # 2). This follows directly from the work performed under Step one. Projections will be done on a yearly basis, leading directly to a timeline for each of the occupations in greatest demand. Occupations will be grouped as belonging to the pre-drilling, drilling or post-drilling phase. Pre-drilling jobs come online first, as early as the year before site work starts. Post-drilling occupations, in turn, are unique in that they will last permanently in a given geographical area. Step 2 will provide the WVDE with a sense of the distribution of occupational demand over time.

Step 3 will translate occupations into skill sets (Outcome # 3) following the process outlined in the Request for Quote. We will code the occupational matrix utilized in our study into the Standard Occupational Classification (SOC) categories used by federal statistical agencies. These categories will then be associated with skills utilizing the “map” developed by the O*NET project for the U.S. Department of Labor.² The end result will be a list of skill sets required by each of the major occupations in demand.

² See <http://online.onetcenter.org/>. O*NET has been created for the U.S. Department of Labor, Employment and Training Administration, by the National Center For O*NET Development.

Step 4 will consist of developing recommendations (Outcome # 4) for WVDoe on the creation and/or reformulation of existing education and training programs to support the growth of the West Virginia's gas industry. We anticipate that this will be a highly interactive phase. We will discuss our findings with the WVDoe as well as with key industry organizations -- Energizing West Virginia, the Independent Oil and Gas Association of West Virginia and the West Virginia Oil and Natural Gas Association. We will consider the state of existing programs, as exemplified by the Appalachian Basin Training Center developed by Pierpont Technical and Community College. On the basis of these discussions and of the research findings we will formulate recommendations for changes and/or additions to the existing menu of educational and training offerings.

Budget

WIN and PennTech will perform the work described in this proposal for a total fee of \$50,000. This is a not to exceed bid.

WIN's direct professional service fee will total \$40,000 and will include a minimum of 320 hours of professional services based on a rate of \$125.00 per hour. Pennsylvania Technical College will work as a subcontractor to WIN for a total fee of \$10,000, billed at the same rate (\$125.00 per hour).

Dr. Silvio Baretta, WIN Senior Partner, will be the project leader. Dr. Baretta's bio can be found in this proposal's Attachments.

A breakdown and allocation of estimated costs follows.

Outcome 1, 264 estimated hours	\$33,000
Outcome 2, 28 estimated hours	3,500
Outcome 3, 28 estimated hours	3,500
Outcome 4, 80 estimated hours	10,000
Total Project Cost	\$50,000

ATTACHMENT ONE

Dr. Silvio Baretta's Bio

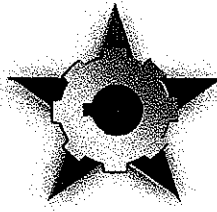
World Class Industrial Network, LLC: A Brief Description

World Class Industrial Network, LLC: 2009-10 Projects and Clients

Silvio D. Baretta
Senior Partner
World Class Industrial Network, LLC

33 Terminal Way, Suite 435
Pittsburgh, PA 15219
Phone: 412-325-1565, x29
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**WORLD-CLASS
INDUSTRIAL
NETWORK, LLC**

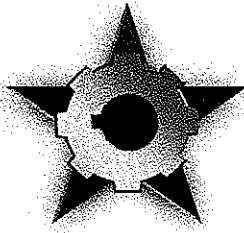
World-Class Industrial Network, LLC (WIN) is an unconventional project development and management-consulting firm focused on improving the impact and performance of the organizations it serves. WIN has been in business for 18 years providing strategic, program design and implementation, and information technology consulting services to clients that include universities, economic development entities, social service agencies, workforce investment boards, workforce training intermediaries, industry associations, government and private businesses.

The WIN team consists of twelve full-time experienced professionals and a select group of associates that share a sincere and compassionate commitment to look beyond traditional solutions. WIN works with a client to identify strategies, build organizational infrastructure, and implement creative solutions that evolve and improve based on models of performance supported by data collection and analysis. WIN consultants utilize three basic principles when working on a project:

- **Organizing**
Systematically involving people and organizations in the process of identifying and developing a common purpose and direction.
- **Quality**
Applying tools and methods of continuous performance improvement and satisfaction.
- **Networking**
Increasing the magnitude of positive change through the use of flexible enterprise principles.

WIN current service areas include:

- **Workforce System Innovations:** Designing and implementing collaboration-driven workforce development models that bring together industry, education, community and public sector stakeholders.
- **Operations Performance Improvement:** Manufacturing and organization process improvement consulting and training based on lean manufacturing principles and the Theory of Constraints.
- **Information [over] Technology:** Information technology strategic planning, solution design, systems integration and implementation services targeting economic development agencies, non-profits and manufacturers.
- **Energy and Environment Initiatives:** Development, planning and management of initiatives to support businesses, non-profits and community groups in achieving improved energy performance and a financial return on investment.



Workforce Development Practice

Duquesne University Center for Competitive Workforce Development

- Research, analysis, planning, development, implementation and management of Career Literacy programs and the administration of workforce training for PA Industry Partnerships.

Freedom School District

- Design and Implementation of a College and Career Counseling Program

Goodwill Industries

- Design and Implementation of a System to Recruit Incumbent Workers for Nursing Careers within the Allegheny West Penn hospital network (under contract with Goodwill Industries)
- Customer Service Training Initiative

Keystone Research Center

- Research, development and implementation of the Labor Management Clearinghouse Initiative for Pittsburgh/Allegheny County.
- Living Cities/Pennsylvania Fund for Workforce Development -- project management.

National Center for Defense Machining and Manufacturing

- Development of Education and Training Curriculum for Technology Solutions

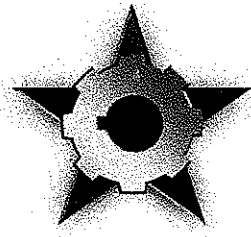
National Tooling and Machining Association

- Strategic Planning and Project Management for a National 'Precision Jobs for American Manufacturing' Initiative

New Century Careers

Research, Analysis, Planning, Development, Implementation, Management

- Manufacturing 2000, Entry-Level Machinist Training Program
- Manufacturing 2000 Plus, Advanced Training for Manufacturing Workers
- Advanced Manufacturing Career Collaborative
- Pittsburgh Chapter National Tooling and Machining Association Apprenticeship Program and Bots IQ
- COMPETE Industry Partnership and Incumbent Worker Training Initiative



Pittsburgh Gateways Corporation

- Contracted to assist in the development and implementation of a US Department of Justice-funded Connections Center Initiative. The initiative is focused on at-risk youth in the Hill, Lawrenceville and other East End communities of Pittsburgh.
- Leading an effort to design an education and workforce strategy as well as training programs for the *Penn State University Electro Optics Center*.

Southwest Corner Workforce Investment Board

Research, Analysis, Planning, Development, Implementation, Management

- Building and Construction Industry Partnership & Incumbent Worker Training
- Logistics and Transportation Industry Partnership & Incumbent Worker Training
- PA Alliance for Security and Preparedness Industry Partnership & Incumbent Worker Training
- Mining Industry Partnership
- Oil and Gas (Marcellus Shale) Industry Partnership

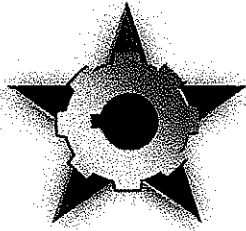
Three Rivers Workforce Investment Board

Research, Analysis, Planning, Development, Implementation, Management

- Materials Science Industry Partnership and Incumbent Worker Training
- Green Careers Training Initiative
- Green Careers Curriculum Development.

United Way of Allegheny County

- Implement and manage the "Be A 6th Grade Mentor" program at the South Brook Middle School in the Pittsburgh Public School System.



**Operations Performance Improvement and
Information (over) Technology Practice**

4th Economy (Sustainable Business Network) Philadelphia

- Provide I/T consulting services to assist SBN in improving information systems management.

A+ Schools

- I/T opportunity to convert a Salesforce application into a product/service for small non-profit organizations.

GSP Consulting Corporation

- Develop a web based reporting portal to support the strategic planning and reporting processes of Pennsylvania's Keystone Innovation Zones (KIZ).
- Provide support for the development of an Altoona-Blair County Development Corporation "Energy Consortium."

General Carbide

- Management consulting and workforce training in the elements of Lean Manufacturing.

Hamill Manufacturing

- Planning, selection and implementation of a company-wide ERP system.

Innovation Works

- Selected to implement a Salesforce-based solution to support program and customer management as well as a reporting system for Innovation Works.

YMCA

- Selected to develop and implement a Salesforce-based demonstration solution to support consolidated program reporting at the Greater Pittsburgh Y seventeen locations.

ATTACHMENT TWO

Marcellus Shale Workforce Needs Assessment, Southwest PA

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Executive Summary

The purpose of this Southwest Pennsylvania Marcellus Shale Workforce Needs Assessment is to provide baseline data to assist workforce and economic development professionals estimate the *direct workforce* requirements regarding the types and number of jobs and occupations necessary for the development of Marcellus Shale in Beaver, Washington, Greene, Fayette, and Westmoreland counties in the Southwest region of Pennsylvania over the next five years (2010-2014). This assessment was created by the Marcellus Shale Education & Training Center (MSETC), which was formed to serve as a primary workforce development resource for the natural gas industry.

The workforce estimates created within this report are based on actual interviews and online workforce assessments of individuals directly involved with bringing a Marcellus well into production. This report is based solely on the actual employees directly involved in developing a well and placing it into production and does not consider employment impacts beyond those directly employed in that process. The projections in this report are not intended to serve as a measure of the total employment created by Marcellus Shale natural gas development or to estimate the economic impact of such development. The findings of this report, therefore, should not be compared to employment estimates of other studies that project the *overall* employment and economic impact of natural gas drilling in Pennsylvania using “multipliers” to estimate job creation in sectors other than those *directly* associated with the natural gas sector. This report provides the best estimate currently available of workers needed to bring a Marcellus well into production and projected growth in labor demands around high priority occupations for the oil and gas industry.

In the spring of 2010, MSETC team members performed in-depth interviews with many of the major Marcellus Shale energy companies, drilling companies, and service providers operating in the Southwest region. ***The exploration and production companies interviewed represent slightly more than 88% of all permitting activity in 2009-2010.*** To further validate the interview data, the MSETC team created an online workforce needs assessment in the summer of 2010 for gas industry representatives. Thirty (30) respondents completed the online workforce assessment.

After the occupations were identified and the full time equivalent (FTE) numbers were determined, the next major step in creating a viable workforce projection model was to estimate future drilling rig activity. In addition to working with energy operators and subcontractors, the MSETC team reviewed investor statements, press releases, and public statements made by energy company officials regarding their plans for future drilling activity in the region. The results from company interviews and the online workforce assessment helped to confirm the rig/drilling estimates.

Since predicting future trends in the gas industry, particularly with respect to workforce needs, is challenging at best given the uncertain nature of the industry, the MSETC team developed three possible projection scenarios. These three scenarios provide a “low scenario” estimate, a “likely scenario” estimate, and a “high scenario” estimate.

Principal energy companies operating within the Southwest region include Range Resources, CNX, Chesapeake Energy, XTO, Atlas, Eastern American Energy Corp, and EQT. Rig counts and permitting activity within the first six months of 2010 indicate drilling activity in 2010 should equal or slightly eclipse 2009 levels.

The Southwest region has a distinct advantage over other Marcellus Shale regions because many of the large natural gas companies have located regional corporate offices in the greater Pittsburgh area, which provides local opportunities to fill large numbers of white-collar jobs located at these offices. White-collar, or "office" jobs, in the gas industry tend to be more geographically stable than other types of work that must be performed on a development location.

The MSETC model revealed that **over 420 individuals working within nearly 150 different occupations** are needed to perform all the operations required to complete and produce gas from a single Marcellus Shale well in Southwest Pennsylvania. The total hours worked by these individuals are the equivalent of 13.10 FTE direct jobs over the course of a year for dry gas wells and 13.30 FTE for high-BTU gas wells. Of these FTEs, 12.9 are required during the pre-drilling and drilling phase, while 0.18 are required during the production phase for dry gas wells and .38 are required for high-BTU gas. It is estimated that 60% or more of wells drilled in the Southwest region will require gas processing. According to an analysis of publicly made statements and personal interviews with companies operating in the region, the number of wells drilled could increase from approximately 330 wells per year in 2010 to roughly 470 wells per year in 2011 and 779 wells per year by 2013.

Applying the MSETC workforce projection model to the current and projected 2010 well drilling activity in Beaver, Greene, Fayette, Washington, and Westmoreland counties indicated that **between 3,831 and 6,334 FTE direct jobs would be required, with 5,083 FTE jobs being the likely workforce development scenario** based on development projections given by energy developers. Of the 3,831 to 6,334 FTE direct jobs, the number of long-term production phase jobs created will be between 155 and 257, with 206 being a best estimate based on extant 2010 information and an assumption of 60% of the wells requiring gas processing.

The model indicates that the number of jobs will increase over the five-year period from 2010 to 2014. **The FTE direct workforce is expected to increase by over 2,000 within the next two years** to between 6,880 and 11,424 workers required by 2012, with 9,152 required workers being a likely scenario estimate. **By 2014, the number is expected to range from 8,160 to 13,559 depending on the development activity, with 10,860 workers being the likely workforce need.** The total number of long-term production phase jobs (including gas processing) created by wells drilled between 2010-2014 will total between 800 and 1,300 full-time jobs, depending on the total number of wells actually drilled.

Introduction

Aim of This Report

This assessment is intended to provide baseline data to assist workforce and economic development professionals estimate the direct workforce requirements regarding the types and number of jobs and occupations necessary for the development of Marcellus Shale in Beaver, Washington, Greene, Fayette, and Westmoreland counties in the Southwest region of Pennsylvania over the next five years (2010-2014).

The workforce estimates created within this report are based on actual interviews and online workforce assessments of individuals directly involved with bringing a Marcellus well into production. The report is based solely on the actual employees directly involved in developing a well and placing it into production and does not consider employment impacts beyond those directly employed in that process. The projections in this report are not intended to serve as a measure of the total employment created by Marcellus Shale natural gas development or to estimate the economic impact of such development. The findings of this report, therefore, should not be compared to employment estimates of other studies, which project the *overall* employment and economic impact of natural gas drilling in Pennsylvania using “multipliers” to estimate job creation in sectors other than those *directly* associated with the natural gas sector. This report provides the best estimate currently available of workers needed to bring a Marcellus well into production and projected growth in labor demands around high priority occupations for the oil and gas industry.

Marcellus Shale Natural Gas Play

Marcellus Shale is a large natural gas formation extending across roughly two-thirds of Pennsylvania and into parts of New York, West Virginia, Virginia, Maryland, and Ohio. Development of Marcellus began in 2003 and grew steadily through 2007 and 2008 in Southwestern Pennsylvania and Northern West Virginia. Growth has dramatically expanded during 2009 and 2010. Currently in Pennsylvania, two hubs of intensive Marcellus activity are centered in the Northern Tier and Southwestern Pennsylvania. These two areas of Marcellus currently comprise the core of development activity, although parts of Central Pennsylvania continue to see an increase in exploratory drilling activity.

Energy companies continue to invest billions of dollars in exploration and development programs throughout Pennsylvania. Investments by the exploration and production companies include securing mineral rights, land, drilling, production stimulation, pipeline, compressor stations, processing, and a variety of other infrastructure investments necessary to operationalize the potential of the Marcellus Shale Play. In 2010, two of the world’s largest energy firms purchased large stakes of Marcellus Shale, and all of the major firms active in the area continue to plan dramatic expansions of their development operations beyond 2010.

The reasons for the planned Marcellus expansion by exploration and production companies are due to a number of factors, including the relative infancy of the Marcellus Play, the close proximity of large

consumer markets and major transmission lines, and the amount of natural gas thought to be recoverable. The amount of total recoverable natural gas located within the formation is currently unknown, although recoverable gas estimates in Marcellus Shale have recently ranged from 50 to 489 trillion cubic feet (Englander 2009). Regardless of the estimates, most geologists place the recoverable gas reserve potential among the largest in the nation.

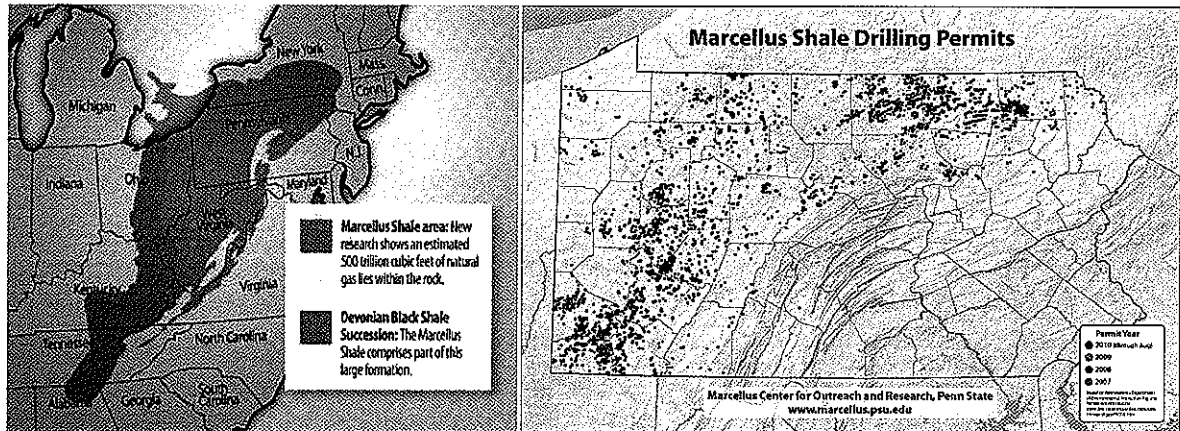


Figure 1 (left): Map of Marcellus Shale Occurrence

Figure 2 (right): Map of Marcellus Drilling Permits in Pennsylvania as of August 2010

(Source: Marcellus Center for Outreach and Research, Penn State)

Southwest Pennsylvania Region

Marcellus Shale development within Pennsylvania first occurred with significant intensity in the Southwest region, with the first well drilled by Range Resources LLC in 2003 in Washington County and corresponding gas production in 2005 (Harper 2008). As of 2010, the Southwestern Pennsylvania counties experiencing levels of significant development include Washington, Greene, Fayette, and Westmoreland. At this time, Allegheny and Beaver counties have not experienced significant Marcellus Shale drilling activity, although that may change in coming years as more suburban and urban areas surrounding Pittsburgh are developed. Allegheny County also appears to be emerging as a future energy hub on the East Coast with a very high concentration of oil and gas related businesses locating central operations there.

Development activity in the Northern Tier region of Pennsylvania expanded dramatically in 2009 and 2010, while the Southwestern region experienced a more sustained level of development. The disparity in development trajectories are likely due to a number of factors including high levels of existing development in the Southwestern region, land availability, infrastructure constraints, and geological differences. In the Southwestern region, the natural gas leasing market is more mature and prime real estate more established, in part because of historical factors such as previous mining and conventional natural gas drilling activity, corporate ownership, and a longer history of Marcellus-driven leasing and drilling activity. The Northern Tier region, in contrast, has recently offered emergent companies large acreages of attainable mineral rights. In addition, analyzing the differences in the geology of the two regions reveals that gas derived from the Southwestern region contains high-BTU gasses and gas liquids,

while the Northern region contains dry gas. The high-BTU gasses and liquids can be extremely marketable; however, limited high volume gas processing infrastructure in the Southwest region appears to have slowed Marcellus development. Construction of additional natural gas processing facilities is underway and will allow for increased gas development in the Southwest Pennsylvania region over the next few years.

**Figure 3: Marcellus Shale Development Activity in Southwest Pennsylvania
2008 - August 1, 2010**

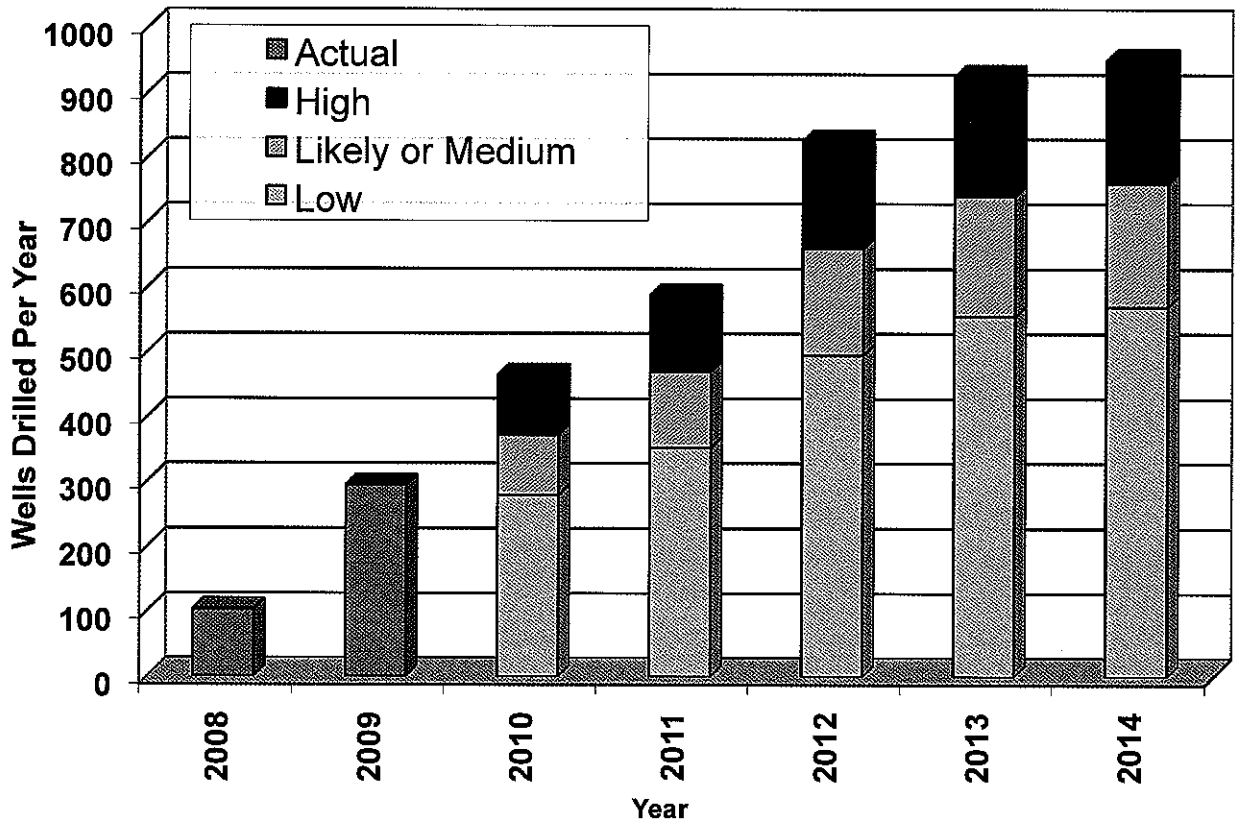
County	Wells Drilled			Permits Issued		
	2008	2009	Aug-10	2008	2009	Aug-10
Allegheny	1	2	0	1	5	2
Armstrong	2	17	13	8	42	18
Beaver	0	0	1	11	6	3
Butler	10	8	16	11	42	38
Indiana	3	8	8	11	19	14
Fayette	18	55	14	45	88	44
Greene	18	91	50	43	182	98
Washington	32	68	98	92	209	175
Westmoreland	19	46	17	28	89	46
Total Southwest	103	295	217	250	682	438
Rest of Pennsylvania	93	468	584	229	1303	1283
Total Pennsylvania	196	763	801	479	1985	1721

Source: PA DEP

Southwestern Pennsylvania Development Projections

Development growth of Marcellus Shale natural gas reserves in the Southwestern region has been moderate in recent years. Companies active in the area have made public statements that they intend to dramatically increase levels of development intensity within the Southwest region in 2011 and beyond. Principal energy companies operating within the Southwest region include Range Resources, CNX, Chesapeake Energy, XTO, Eastern American Energy Corp, Atlas, and EQT. These companies represent roughly 88% of all Marcellus Shale permitting activity in both 2009 and the first six months of 2010 for Beaver, Greene, Fayette, Washington, and Westmoreland counties. Rig counts and permitting activity within the first six months of 2010 show that drilling activity in 2010 should equal or slightly eclipse 2009 levels. According to an analysis by MSETC of publicly made statements and personal interviews with companies operating in the region, the number of wells drilled could increase from approximately 330 wells per year in 2010 to roughly 470 wells per year in 2011, and 779 wells per year by 2013.

Figure 4: Actual/Projected SW PA Marcellus Wells Drilled Per Year



High-BTU Gas

A big factor in the projected increase of drilling activity in the Southwest region is due to the economic attractiveness of liquids-rich, high-BTU gas found in parts of Marcellus Shale that is located in Southwestern Pennsylvania. High-BTU gas requires large processing facilities to extract the liquids such as oil and heavy gasoline and fractionate other gas compounds found within the produced methane. The result of high-BTU gas processing is a multitude of saleable products that can significantly raise the return on investment and produce potentially higher profits under lower natural gas commodity prices. Some media reports have labeled the attractiveness of high-BTU gas as a "Race to Liquids" as companies devote significant resources to liquid-rich areas (Braziel 2010). Like many aspects of natural gas development, the continued attractiveness of high-BTU gas will likely remain variable and dependent on a number of different factors, including commodity price.

The exact boundary of wet vs. dry gas is unclear at this time, although wet/high-BTU gas is understood to be principally found in Washington, Greene, and Beaver counties, as well as western portions of Fayette and Westmoreland counties and the southern portion of Butler County. Interestingly, all of Allegheny County is in the wet gas area and may contribute to future development activity in that county.

Projecting development activity that will occur specifically within the high-BTU gas region is more difficult. Permitting activity reported by the Pennsylvania Department of Environmental Protection, as well as discussions with operators in the area, suggest that between 60-75% of the wells drilled in the Southwest region within the next several years may be liquids-rich, high-BTU gas that requires additional processing.

Introduction to the Natural Gas Industry Workforce

Extraction Timeline

Lifespan totaling approximately 30-50 years

	Permitting Up to 2 mos.	Pipeline Construction Construction time depends on pipeline length			Natural Gas Production Wells can be productive over a 30-50 year period	
		Drilling 30-45 days				
Pre-Drilling		Drilling & Completion		Production/Reclamation		
Geology Studies Up to six months		Staking Well 30-60 days		Fracing & Completion 1-2 wks.		Reclaiming 1 month +
Mineral Rights						

© 2009 Marcellus Shale Education & Training Center

Figure 5: Phases and Timeline of Development of Marcellus Shale Natural Gas Wells

The Marcellus Shale development process differs significantly from that of Pennsylvania's long tradition of extracting shallow gas. Due to differences in geology, technology, and energy company practices the extraction of Marcellus Shale requires more employees and significantly greater input and utilization of supplies, materials, and equipment. Marcellus Shale gas is considered "unconventional" in that the formation requires directional drilling, hydraulic-fracturing, and other methods to produce commercial quantities of natural gas. These processes are much more industrial in nature, labor intensive, and technologically advanced than conventional shallow gas development. Additionally, the energy companies and contractors that initially developed and utilized the unconventional shale drilling and extraction technology were mostly national or international in size and, subsequently, utilized contractors and personnel with legacy shale gas knowledge from around the country and from other parts of the world to begin developing Marcellus Shale.

History has shown that predicting future trends of the natural gas industry can be challenging and estimating the workforce requirements of this particular industry represents an even greater challenge. Natural gas development trends can be difficult to predict as commodity prices, technological changes, new plays, and other factors can change the intensity and scope of development rather quickly. Additionally, a wide array of energy companies and an even wider array of subcontractors comprise the industry, and the resulting complex web of occupational needs and workforce requirements can be difficult to estimate even under ideal circumstances. Additionally, the industry challenges the general definition of an industry sector and local worker, as employees supporting natural gas development work across a variety of industry sectors and often work in multiple locations within a region to develop hundreds of different wells and infrastructure projects. Furthermore, industry employees will sometimes work 12-hour shifts for weeks at a time and then be afforded several continuous weeks of leave while an entirely new crew of workers takes their place.

Locations and Residency in the Southwest Region

Due to the inherent uncertainty of development intensity, as well as the need to work at multiple locations, many of the initial Marcellus Shale-related workers remain only transient residents of the region and keep permanent residency at a location hundreds or even thousands of miles away. As the Marcellus Play continues to mature, the industry is moving towards a workforce that contains fewer transient workers and more permanent Pennsylvania residents.

Since many contractors and subcontractors are accustomed to working at multiple and changing locations throughout North America and the world, it is commonplace within the natural gas industry to initially utilize non-local workforces and supply-chain services. However, as development moves forward over the course of months and years, contractors and subcontractors will either relocate to the local area or local businesses will be created to meet industry needs. Development activity in the Southwestern region of Pennsylvania is not new, and this transition has been underway for some time. National and international drilling companies, gas field service, and gas field construction firms have already opened regional offices in Southwestern Pennsylvania. Many of these companies initially brought an external workforce with them to the area, but are in the process of replacing this workforce with local workers as opportunities arise. In addition, companies that have historically catered to

conventional shallow natural gas and oil field development have significantly augmented their businesses to include work in Marcellus Shale.

The Southwest region also has a large advantage over other Marcellus Shale regions in that many of the large natural gas companies have located their regional corporate offices in the greater Pittsburgh area, which provides local opportunities to fill large numbers of white-collar jobs located at these offices. White-collar, or “office”, jobs in the gas industry tend to be more geographically stable than other types of work that must be performed on a development location.

Data on the geographic origin or residency of the current natural gas workforce present in Southwestern Pennsylvania is not yet available; however, anecdotal evidence and experience from natural gas plays in other areas have shown that many of the jobs created by natural gas development in Southwestern Pennsylvania have been initially filled by transient or non-local workers, but that the majority of these jobs have the potential to be filled locally if/when the properly trained and skilled workers are available.

Drilling Phase Jobs vs. Production Phase Jobs

The natural gas development process is such that a large proportion of the total industry workforce will be required during the well drilling phase, while a small minority of the workforce will be required for the long-term production phase. Pre-drilling and drilling phase jobs are grouped together for purposes of this section of the assessment.

Drilling Phase Jobs

The phase of natural gas development during which the natural gas wells are drilled and the associated pipeline infrastructure is put into place is an extremely labor-intensive process. The workforce needed during this phase constitutes over 98% of the industry workforce needs, and this segment of the workforce will no longer be needed once the process of drilling gas wells in an area is completed. In the oil and natural gas industries, this drilling phase period is often referred to as “the boom” as vast workforces are often suddenly required to perform tasks associated with natural gas development. Conversely, the drilling phase can suddenly decline, which is often referred to within the industry as the “the bust”. Given the level of uncertainty, many employees in the drilling phase of gas development maintain temporary residency in a given area – such as in motels, RVs, “man camps”, monthly apartment/house leases, etc.

No one can say for certain how long the drilling phase will last within Marcellus Shale or within specific areas of the shale formation. Drilling phase estimates have ranged from 10 to 70 years, which in part reflects uncertainty created by future fluctuations in commodity prices, economic conditions, and technological changes, among other variables. A number of scenarios can be envisioned, ranging from sustained decades-long drilling activity to drilling activity that jumps from hotspot to hotspot within the state after a few years in each area to a relatively quick flurry of activity that subsides after a number of years.

Production Phase Jobs

In contrast to drilling phase jobs, jobs associated with the production phase are well defined and predictable, as these jobs are required to manage production operations for existing wells. Industry experts believe the wells created as part of the Marcellus Shale region will likely produce gas for 30 years or more. Even if drilling were to cease completely, the “production phase” jobs necessary to manage and maintain these wells would still be required.

Within the industry, careers associated with the production phase are often referred to as long-term or even “permanent”. Occupations during the production phase tend to be less labor-intensive, with fewer hazards involved, and more specialization than development phase occupations, while still retaining excellent salary and benefits. Jobs associated with production activities almost always result in local residency and often utilize local workforces.

The high-BTU gas that is present in roughly 60% of the Southwestern study area offers an additional opportunity for local production phase jobs. Local high-BTU natural gas processing is needed to fractionate or remove non-methane compounds (non-natural gas such as butane, ethane, propane, etc.) and liquids (oil, water, heavy gasoline, etc.) that naturally occur in the area. Similar to other natural gas production, high-BTU processing facilities and jobs will remain for the life of the well and significantly longer than drilling operations. Occupations associated with high-BTU gas production are somewhat similar to other production phase occupations and include compressor operations, pipeline maintenance and technicians, information technology, gauge monitoring, supervisory positions, process engineers, loader/testers, etc.

MSETC Workforce Model

Given the complex web of occupations that constitute the natural gas industry workforce, traditional methods of measuring future job creation used in other industries are often inadequate. Many of the industries that participate in the development of a natural gas field are usually not present in the area before the natural gas development process begins; thus capturing their workforce needs using most workforce projection models is ineffective at best given there is no local baseline data. Similarly, given the uncertainty in natural gas development, job estimates predicated solely on posted job openings or industry questionnaires – while providing an accurate snapshot of current demand – are largely inflexible to the constantly changing intensity of development activity. Finally, given the intense use of subcontractors by most exploration and production companies, using a strict definition of “local” as a municipal boundary or “industry” as only a natural gas industry economic code does not accurately reflect the complexity, interconnectedness, and the true scope of natural gas related jobs and opportunities.

Methodology

The Marcellus Shale Education & Training Center (MSETC) developed the method used in this study to estimate the workforce requirements of the natural gas industry. The proprietary methodology focuses on analyzing the types and numbers of workers needed to drill a single Marcellus Shale gas well and then extrapolates that data to achieve a total workforce requirement based on estimates of future well drilling activity. At the core of the MSETC model is a full time equivalent (FTE) calculation for each worker associated with drilling a single Marcellus Shale well. An FTE for each worker is 260 days per year. Many tasks that occur during the well drilling process may only require a few workdays to complete. Therefore, the “per well” work requirement for most of the occupational categories ranged from 1/10 to 1/100 of an FTE. In addition, some very labor-intensive occupations such as heavy equipment operation, office staff, and drilling rig operation (roughnecks) constituted an equivalent that ranged between 1/10 to as many as two (2) FTEs per well.

Determining fractional FTE numbers for each worker directly associated with drilling a natural gas well is a complex process. FTE numbers for the majority of occupations involve identifying the number of workers in a particular occupation or work crew and then determining the number of days the workers typically spend on a well site or in support of well site development. FTE numbers for a portion of the occupations - including pipeline construction, land clearing, office staff, etc. – are highly variable from company to company based on specific conditions; therefore, rough averages were used to reduce the differences in company development practice.

$$\frac{(\text{Workers Per Well}) \times (\text{Work Days per Well})}{260} \times (\text{Drilling Rigs} * 10) = \text{Workforce Requirements}$$

Figure 6: General Equation Behind Workforce Model

(The average number of workdays for one FTE worker is equal to 260. A Marcellus Shale drilling rig will drill 10 wells per year on average.)

History of This Workforce Model

In 2009, the MSETC team worked closely with representatives from a number of energy firms, drilling companies, and subcontractors operating in the Northern Tier and Central regions of Pennsylvania to produce a workforce needs assessment for the Central Pennsylvania Workforce Development Corporation, Northern Tier Regional Planning and Development Commission, through Pennsylvania Department of Labor and Industry Partnership funding. During the initial assessment process, nearly 150 occupational categories and/or skill groups were identified.

In the spring of 2010, MSETC team members performed in-depth interviews with many of the major Marcellus Shale energy companies, drilling companies, and service providers operating in the Southwest region. ***The exploration and production companies interviewed represent slightly more than 88% of all***

permitting activity in 2009-2010. These discussions were designed to reconfirm the data obtained in the 2009 study and to identify differences in industry practices and jobs in the Southwest region. To solidify the interview data, the MSETC team created an online workforce needs assessment in the summer of 2010 for gas industry representatives. Thirty (30) respondents completed the online workforce assessment.

After the occupations were identified and the FTE numbers were determined, the next major step in creating a viable workforce projection model was to estimate future drilling rig activity. In addition to working with energy operators and subcontractors, the MSETC team reviewed investor statements, press releases, and public statements made by energy company officials regarding their plans for future drilling activity in the region. The results from company interviews and the online workforce assessment helped to confirm the rig/drilling estimates. With this method, estimates were determined for all the major and most minor energy companies operating in the region, even though 50% of the companies operating in the five-county study area had two or fewer permits.

Advantages, Limitations, and Key Assumptions of the MSETC Model

Methodology

This model allows the user to identify a projected level of development intensity as measured by wells drilled per year (the input) and project the number of workers based on occupational categories (the output) required for the expected level of development.

For the purposes of assessing potential workforce needs and workforce development/education capabilities, this type of model is superior to a number of different methods; however, this model still has a number of different limitations. The advantages, limitations, and key assumptions of the model and methodology follow.

Advantages:

- Offers much more specific occupational descriptions than generic “industrial classifications”
- Does not include/exclude based on industrial classifications
- Uses direct worker requirements, not complex imputations of requirements
- Does not include/exclude based on the geographic locations of business offices
- Does not rely primarily on sampling or response rates (such as surveys)
- Can easily be changed as development scenarios fluctuate
- Allows for triangulation of multiple data sources

Limitations:

- Does not (currently) calculate the specific workplace locations of all the occupations; most occupations will occur at the development site, but other occupations may occur elsewhere in the state or country
- Does not (currently) specifically calculate or define indirect or induced economic or workforce impacts of these jobs (e.g. additional jobs created by businesses providing this indirect or supply-chain support, such as for parts and materials, maintenance and repair, equipment, janitorial services, office supplies, etc., and additional jobs created by the workers spending their income)
- Does not include many indirect or supply-chain industries or workforces
- Does not provide business-specific information such as name, size, location, etc.
- Does not include all workers/contactors (such as all contracted legal services)

Key Assumptions:

- Full time equivalent (FTE) is defined at 260 workdays per year.
- The average drilling rig will drill approximately 10 wells per year.
- Each well will require, on average, 1 mile of pipeline construction.
- One compressor station will be constructed, on average, for every 20 wells.
- Companies' current drilling rig projections are relatively accurate (for the 'likely' scenarios).

Key Assumptions of High-BTU Gas Workforce Estimates

The workforces associated with high-BTU gas processing facilities do not easily conform to a per-well estimate, as *these workforces are directly tied to the amount of total gas production and not numbers of development sites*. The amount of total gas production in a geographical area will accumulate each and every year during the phase of intensive drilling; however, the production from each well will dramatically decline each year after the well first produces gas. This means that the total gas production for a given area will depend on the cumulative number of wells producing, subject to the age of each of the wells.

After detailed interviews with gas processing companies, we based the high-BTU processing workforce estimates on the following assumptions.

- The production facility capacity and staffing is approximately one FTE for every 7.5 million cubic feet of gas processed per day.
- Each well will follow an average production curve of Year 1: 4MMcf/d; Year 2: 1.2MMcf/d; Year 3: 900Mcf/d; Year 4: 800Mcf/d; Year 5: 700Mcf/d.
- Approximately 60% of wells drilled in the Southwest region will require processing.

Natural Gas Workforce Requirements Interviews and Online Workforce Assessment

MSETC team members performed eight in-depth interviews with Marcellus Shale-related companies operating in Southwestern Pennsylvania and created an online workforce assessment that received responses from an additional 30 companies. The purpose of the interviews and online workforce assessment was to obtain projections of drilling activity, re-affirm key occupation and FTE assumptions of the workforce model, and obtain data on workforce training and recruitment trends.

Workforce Survey Results: What are biggest challenges to finding new workers?

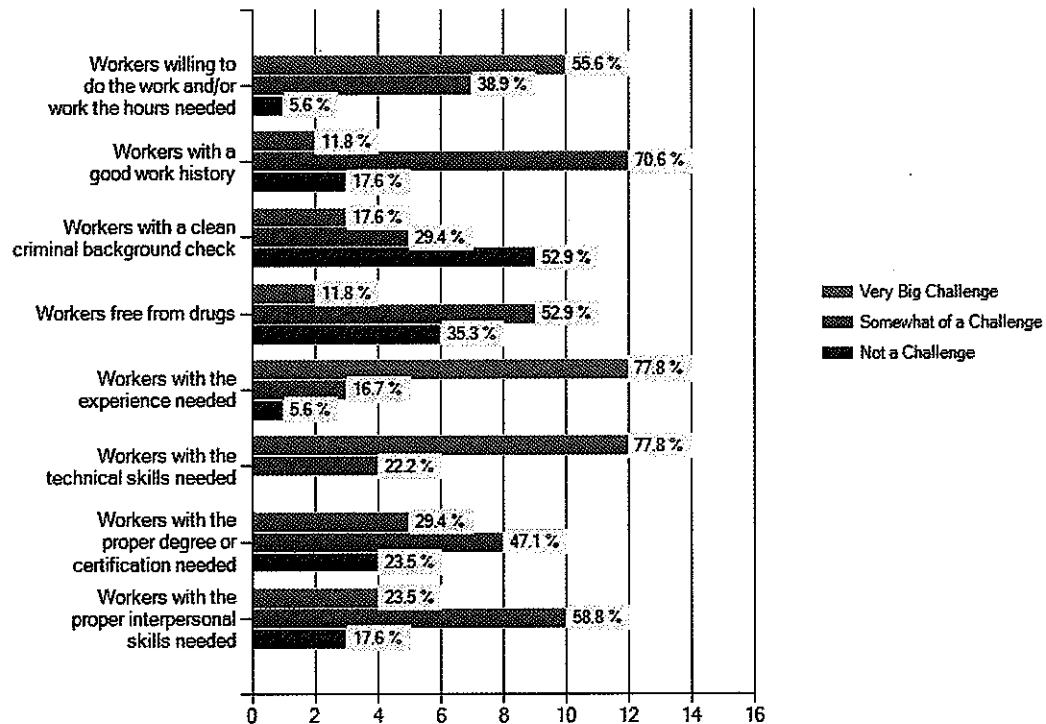


Figure 7: Biggest Challenges to Finding New Workers

In general, the results of the online workforce assessment confirmed much of the interview data regarding well development projections, workforce development, and assumptions about workforce needs. While the respondents to the online workforce assessment remained anonymous, respondent estimates of well development activity within the next five years were very similar to published reports and in person interviews with operators.

Online workforce assessment results regarding questions about workforce development and hiring practices revealed similar results to the 2009 MSETC report and historical data from other natural gas plays. Companies indicated that finding individuals with the proper work ethic, general mechanical aptitude, and general experience within the industry remained the largest barriers to finding local

workers. Most respondents indicated they used some type of training programs, although the vast majority utilized private or in-house training services, suggesting an opportunity for public workforce development organizations.

Specific occupational areas that have shown the greatest demand include general and semi-skilled office staff, engineering and geology-related occupations, and supervisory roles throughout a range of different types of companies.

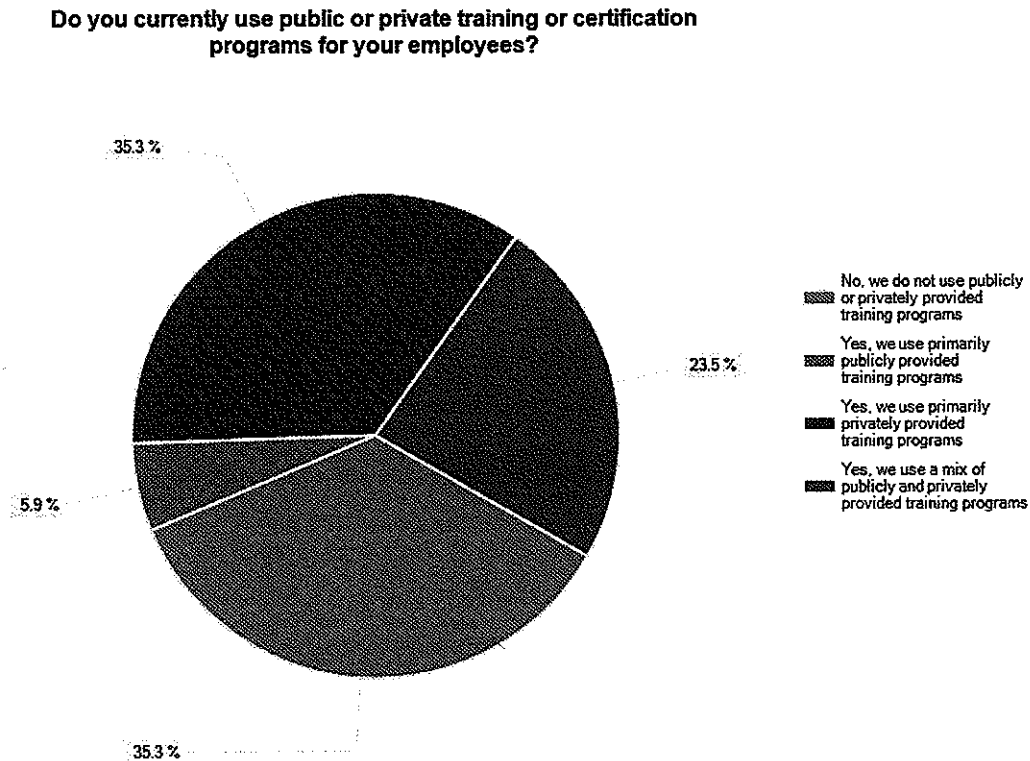


Figure 8: Do you currently use public or private training or certification programs?

Workforce Model Results

Full Time Work Equivalent (or FTE) to Drill One Marcellus Shale Well

The MSETC model revealed that over 420 individuals working within nearly 150 different occupations are needed to perform all the operations required to complete and produce gas from a single Marcellus Shale well in Southwest Pennsylvania. The total hours worked by these individuals are the equivalent of 13.10 FTE direct jobs over the course of a year for dry gas wells and 13.30 FTE for high-BTU gas wells. Of these FTEs, 12.9 are required during the pre-drilling and drilling phase, while 0.18 are required during

the production phase for dry gas wells and .38 are required for high-BTU gas. It is estimated that 60% or more of wells drilled in the Southwest region will require gas processing. As is discussed in the following section, the FTE for high-BTU gas wells will change over time.

In addition to the FTEs associated with the high-BTU gas processing, the findings in this report represents a slight increase over the results of the Northern Tier and Central WIB region workforce assessment performed by MSETC in 2009, partly due to more specific data, as well as additional gas field construction (tank battery and well head natural gas processing equipment) and supervisory jobs that were identified in the Southwestern region. That previous study estimated 11.53 FTEs were required during the drilling phase.

It is important to note that the equivalent of 12.9 pre-drilling and drilling phase jobs for each well do not compound year after year. These workers are required only while wells are being drilled and are a function of the number of wells being drilled each year. For example, if 100 wells are drilled per year, then the total drilling phase workforce will be 1,290. If 100 wells are drilled per year for 10 straight years, the total drilling phase workforce will still remain very close to 1,290. Although these jobs follow the drilling development and the true length of activity remains uncertain, drilling jobs, while geographically short-term, may still be long-term Pennsylvania jobs depending on the development scenario (sustained, hot spot, or flurry development outlined).

The vast majority of jobs directly associated with the staking, scoping, permitting, engineering, logging, clearing, drilling, moving, finishing, cementing, completing, fracturing, and producing a well are included in the estimate, as well as the majority of jobs required to clear, dig, and construct collector pipeline and compressor station infrastructure for the well. The workforce estimate includes the vast majority of occupations directly associated with the drilling and completion process, but does not include many of the indirect jobs that will be created in a variety of occupations ranging from legal advice to gravel quarrying to steel pipe fabrication.

Production Phase FTEs

While the vast majority of jobs associated with the natural gas industry occur during the pre-drilling and drilling phase, a number of jobs are associated with monitoring the long-term health and production capability of a natural gas well. These “production” jobs will be required for as long as wells are producing commercial quantities of natural gas, which is currently estimated by university scientists and the exploration and production companies in Marcellus Shale to be over a 30 to 40 year period. The workforce model estimates that 0.18 of these long-term, full-time jobs are created for each dry gas well drilled in a given field (or approximately one worker for every five wells drilled), and 0.38 jobs for every high-BTU well drilled over the next five years. Production jobs do compound each year as more wells are drilled. For example, if 100 dry gas wells were drilled per year for 10 years, 18 of these long-term jobs would be created each year, for a total of 180 long-term jobs created after 10 years. In addition to being long-term in nature, these jobs typically retain the generally excellent salary and benefits found in natural gas development but are generally less hazardous and less labor-intensive than jobs associated with the drilling phase.

Jobs associated with high-BTU gas processing also compound each and every year; however, the amount of required workers per well will decrease over time as the amount of gas that is produced from a well also decreases. Approximately 0.20 production jobs are created per high-BTU gas well for the first five years of production, while over the 30-year life of a well, the average FTE needed for gas processing may be closer to 0.02. However, since this report is concerned with a five-year time horizon, it is the 0.2 number that is used to extrapolate total workforce estimates. During the drilling phase of development, new wells will continue to be drilled; therefore, even though the amount of production for each well is decreasing, the total gas production within a region may continue to increase and thus require a larger workforce until drilling activity slows.

“Direct” Job Creation

As previously noted, the jobs discussed in this assessment are only those *directly* associated with drilling and completing a Marcellus Shale natural gas well and related pipeline construction. Jobs that are not directly associated with the industrial process are not included in this model and are outside the scope of this report. Since the analysis focuses on the specific jobs required for drilling and production without regard to formal industry sectors, it would be illogical to apply workforce or economic multipliers to it, which typically are based upon specific industry sectors.

Total Direct Workforce Requirements for the Southwest Pennsylvania Region

Applying the MSETC workforce projection model to the current and projected 2010 well drilling activity in Beaver, Greene, Fayette, Washington, and Westmoreland counties indicated that between 3,831 and 6,334 FTE direct jobs would be required, with 5,083 FTE jobs being the likely workforce development scenario based on development projections given by energy developers. Of the 3,831 to 6,334 FTE direct jobs, the number of long-term production phase jobs created will be between 155 and 257, with 206 being a best estimate based on extant 2010 information and an assumption of 60% of the wells requiring gas processing.

The model indicates that the number of jobs will increase over the five-year period from 2010 to 2014. The FTE direct workforce is expected to increase by over 2,000 within the next two years to between 6,880 and 11,424 workers required by 2012, with 9,152 required workers being a likely scenario estimate. By 2014, the number is expected to range from 8,160 to 13,559 depending on the development activity, with 10,860 workers being the likely workforce needed.

As described in previous sections, this model does not factor in employment created by natural gas development occurring in other parts of the state or country. Large regional offices are being constructed in Southwest Pennsylvania, and some of these offices will oversee development activity occurring in places such as West Virginia, Northern Pennsylvania, and New York. Employment created by this development is not tallied in this report even though the employees may be based in the Southwestern region.

The total number of long-term production phase jobs (including gas processing) created by wells drilled between 2010-2014 will total between 800 and 1,300 FTE jobs, depending on the total number of wells drilled.

Low Scenario: Estimated SW PA Marcellus Shale Workforce Requirements By Phase

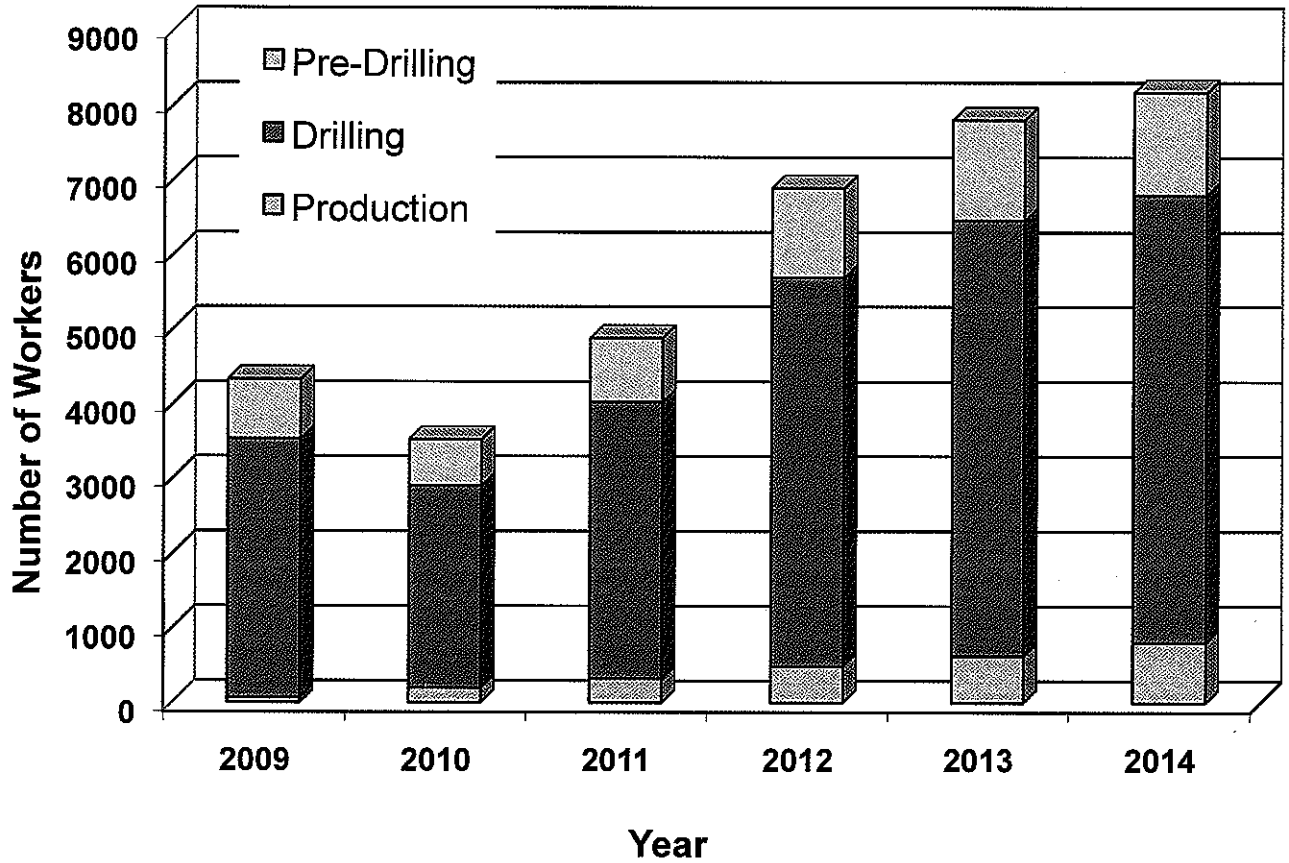


Figure 5: Low Scenario – Marcellus Shale Workforce Requirements by Phase

Medium or 'Likely' Scenario: Estimated SW PA Marcellus Shale Workforce Requirements By Phase

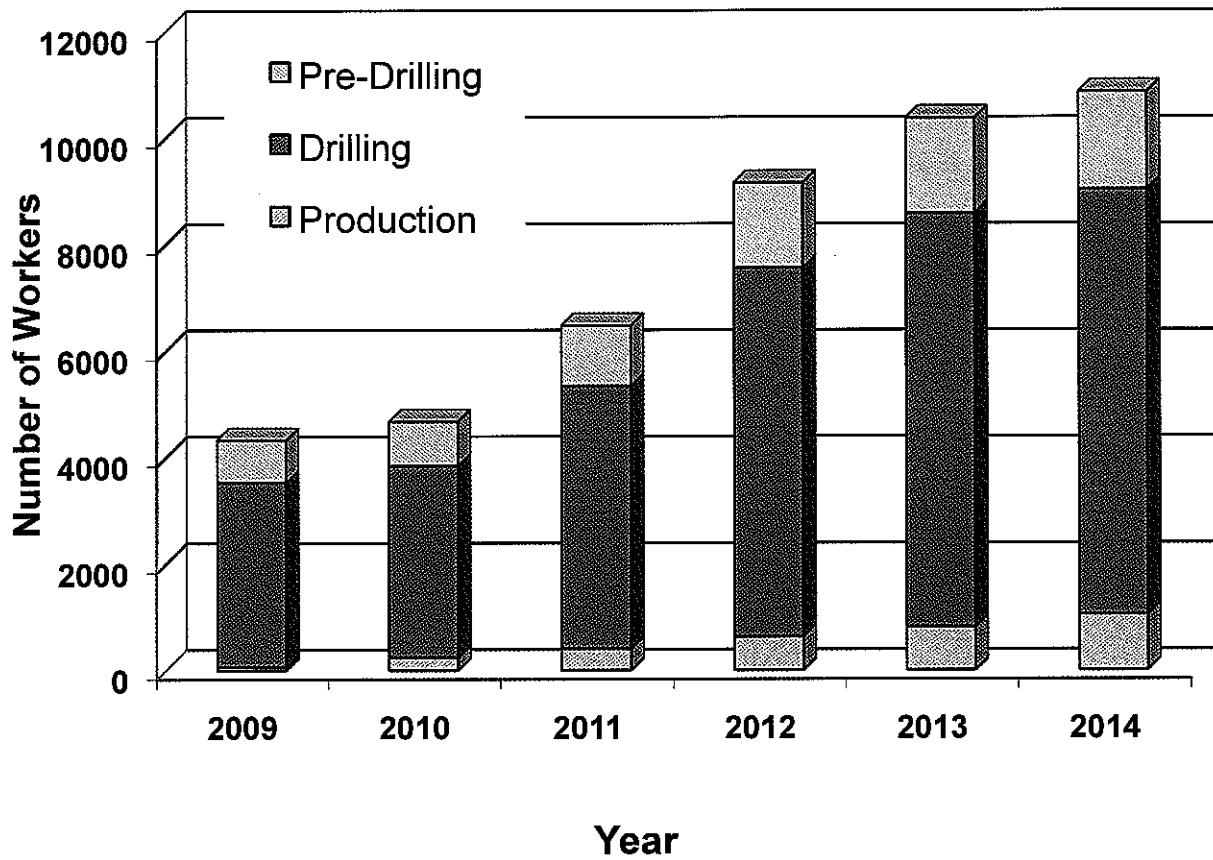


Figure 6: Medium (Likely) Scenario – Marcellus Shale Workforce Requirements by Phase

High Scenario: SW PA Marcellus Shale Workforce Requirements By Phase

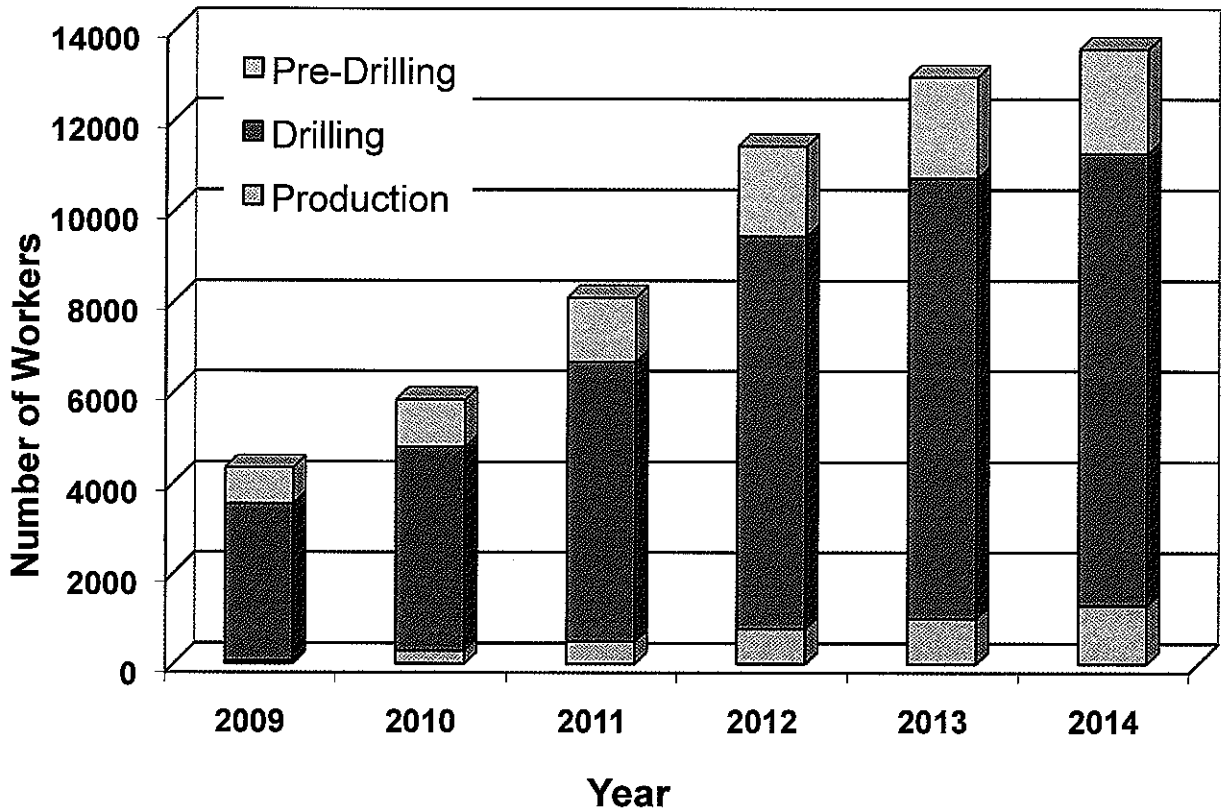


Figure 7: High Scenario – Marcellus Shale Workforce Requirements by Phase

Beyond 2014

Given the fluctuations in development activity that are inherent in the natural gas industry, multi-year development projections can be unreliable. However, the projections in this study are formulated using the best information available at the current time. Projections beyond 2014 are difficult to estimate; however, some indications are that drilling activity may increase over the projected 2014 levels. Continued growth will depend on a multitude of factors, including economic conditions, market demand, supply, commodity prices, technological innovations, competition from other natural gas fields, and infrastructure constraints.

Workforce Locations

The majority of the pre-drilling and drilling phase jobs will be located in the immediate vicinity of the well being drilled. Office workers and some geologic science, engineer, and supervisor jobs will be located at energy company offices, which may or may not be located near the vicinity of the well site or even within the region. The location of these jobs is difficult to determine, as many of these office locations vary from company to company and subcontractor to subcontractor, and companies may change the location of their offices as new development locations emerge. The location of regional

offices will also determine the location of long-term production jobs created in the region. However, the Southwest region is at an advantage over other regions of Marcellus Shale because corporate regional offices are established in the greater Pittsburgh area, and these offices will likely oversee development in West Virginia, Ohio, and New York. The location, or regional corporate offices, within the Southwest area of Pennsylvania means a larger majority of office, supervisory, and other white-collar jobs should remain local.

Occupational Categories Within the Natural Gas Industry

The model and related research found that the majority of the occupations in the direct workforce associated with Marcellus Shale natural gas development are comprised of low-skilled or semi-skilled occupations including heavy equipment operation, commercial driver's license truck operation, general labor, pipe and gauge operation, and a variety of office-related occupations. These occupations account for roughly 70-80% of the workforce. Industry representatives, online workforce assessment respondents, and additional research indicated that most of these occupations require no formal post-secondary education and only a few (such as CDL, welding, X-ray, etc.) require a specialized license or trade certification; however, nearly all of them require the skills and knowledge unique to the natural gas industry, skills and knowledge that are best learned through experience. Workers within all occupations of the natural gas industry are additionally praised for their hard work ethic and willingness to work very long hours in unfavorable conditions. Many of the remaining 25% of workers are in occupations that are white collar in nature, including foremen, supervisors, legal, realty, engineering, and geological sciences, which require some post-secondary education.

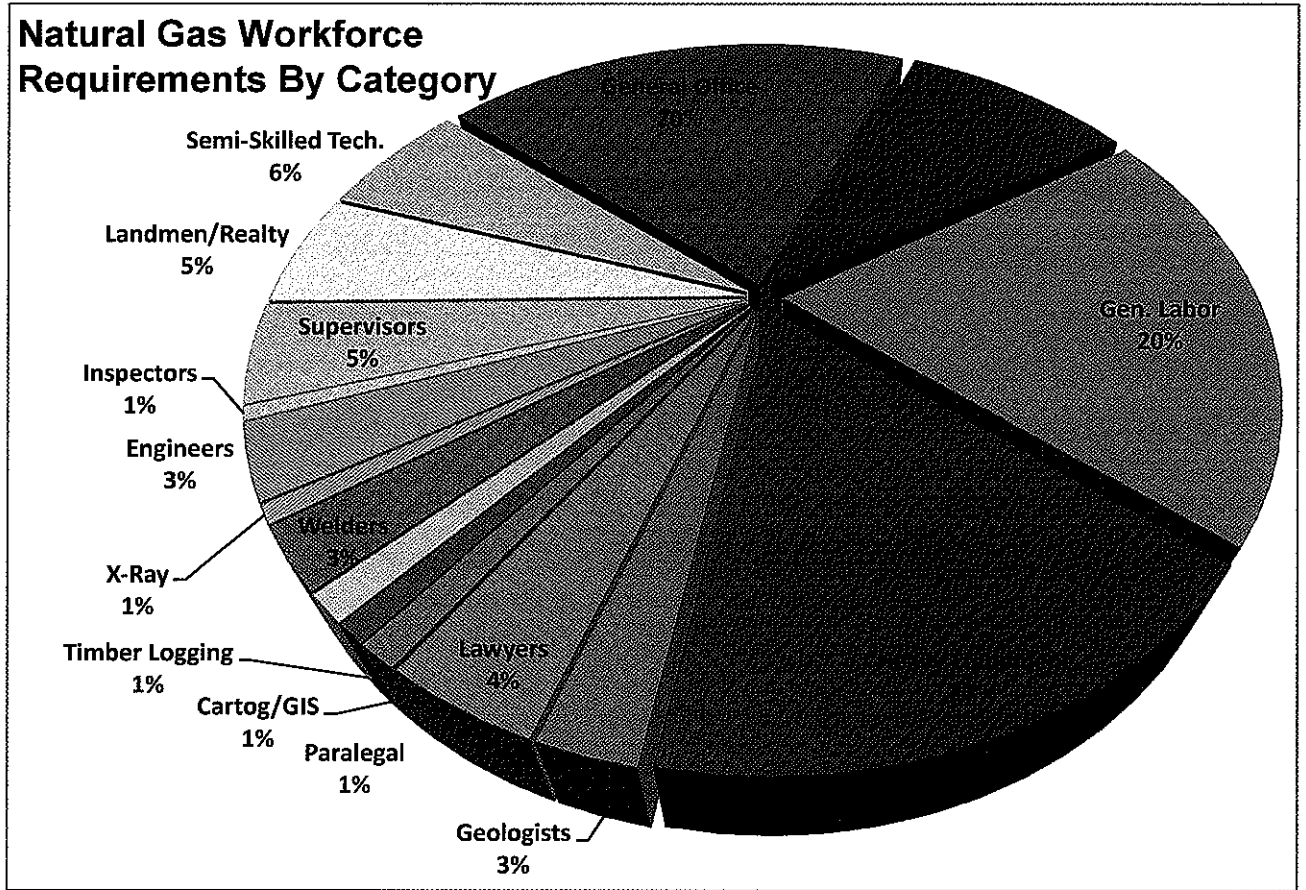


Figure 8: Occupational Composition of Natural Gas Workforces

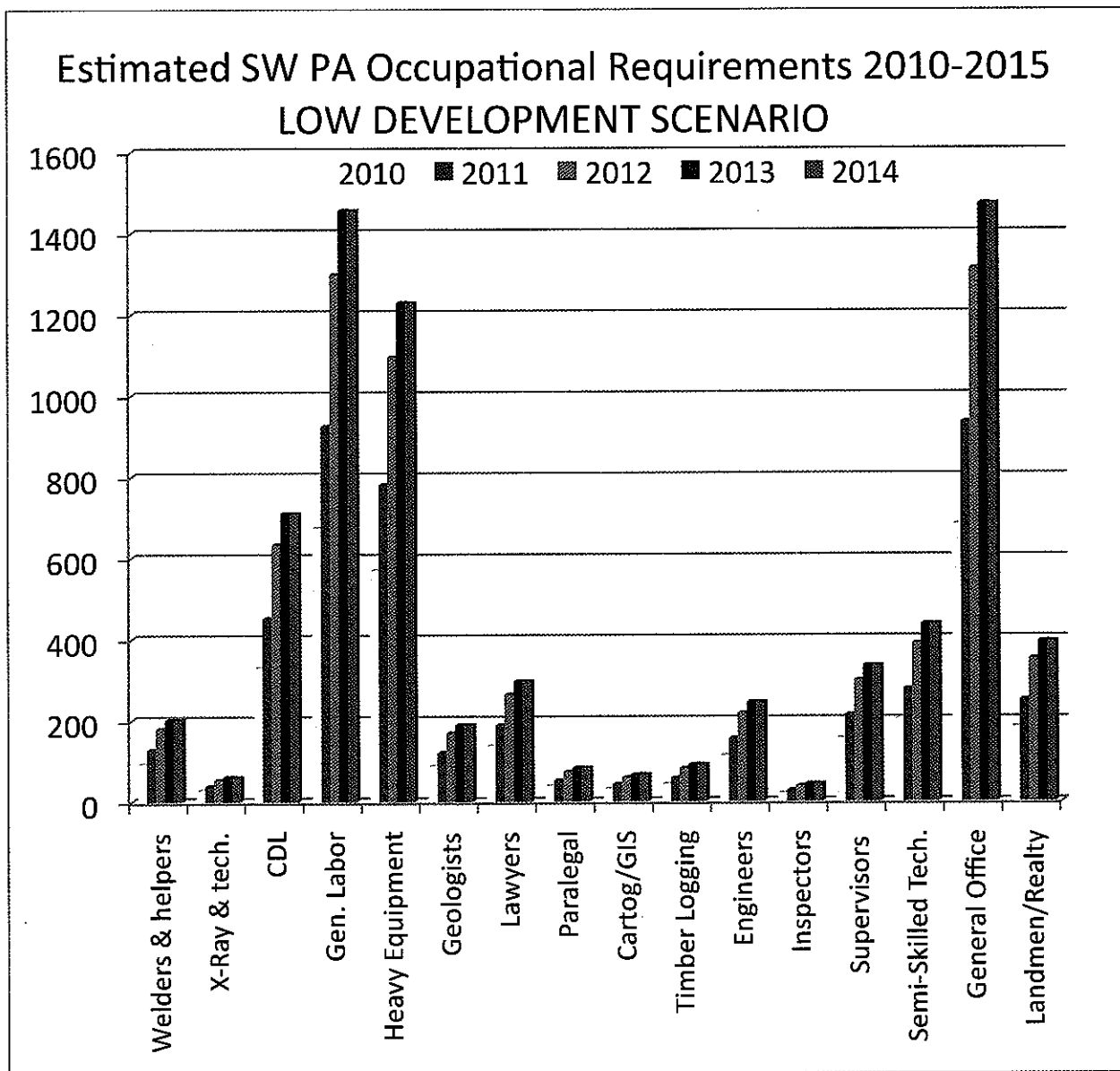


Figure 9: Estimated Occupational Requirements – Low Scenario

Estimated SW PA Occupational Requirements 2010-2014 MEDIUM or 'LIKELY' DEVELOPMENT SCENARIO

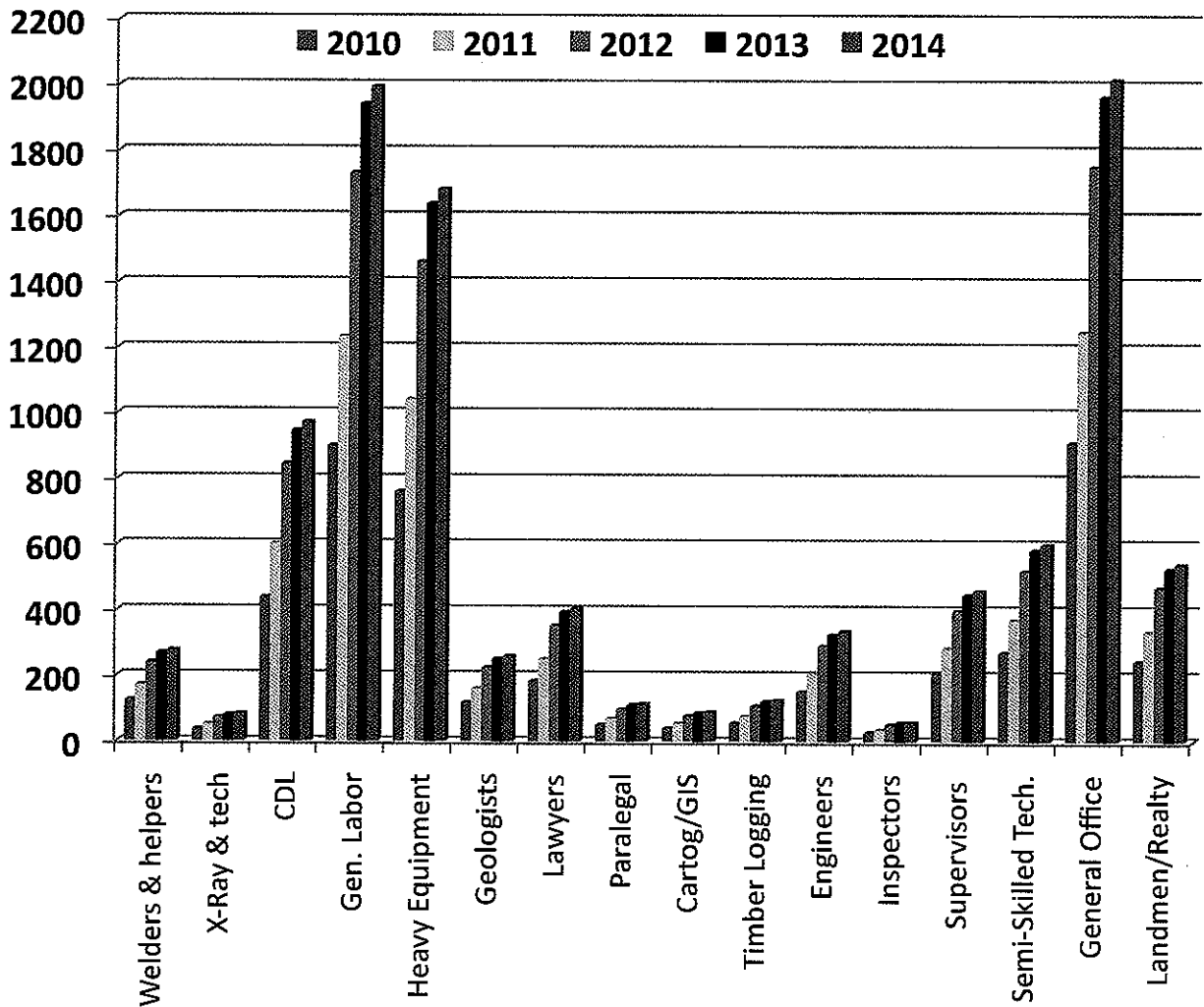


Figure 10: Estimated Occupational Requirements – Medium (Likely) Scenario

Estimated SW PA Occupational Requirements 2010-2013 HIGH DEVELOPMENT SCENARIO

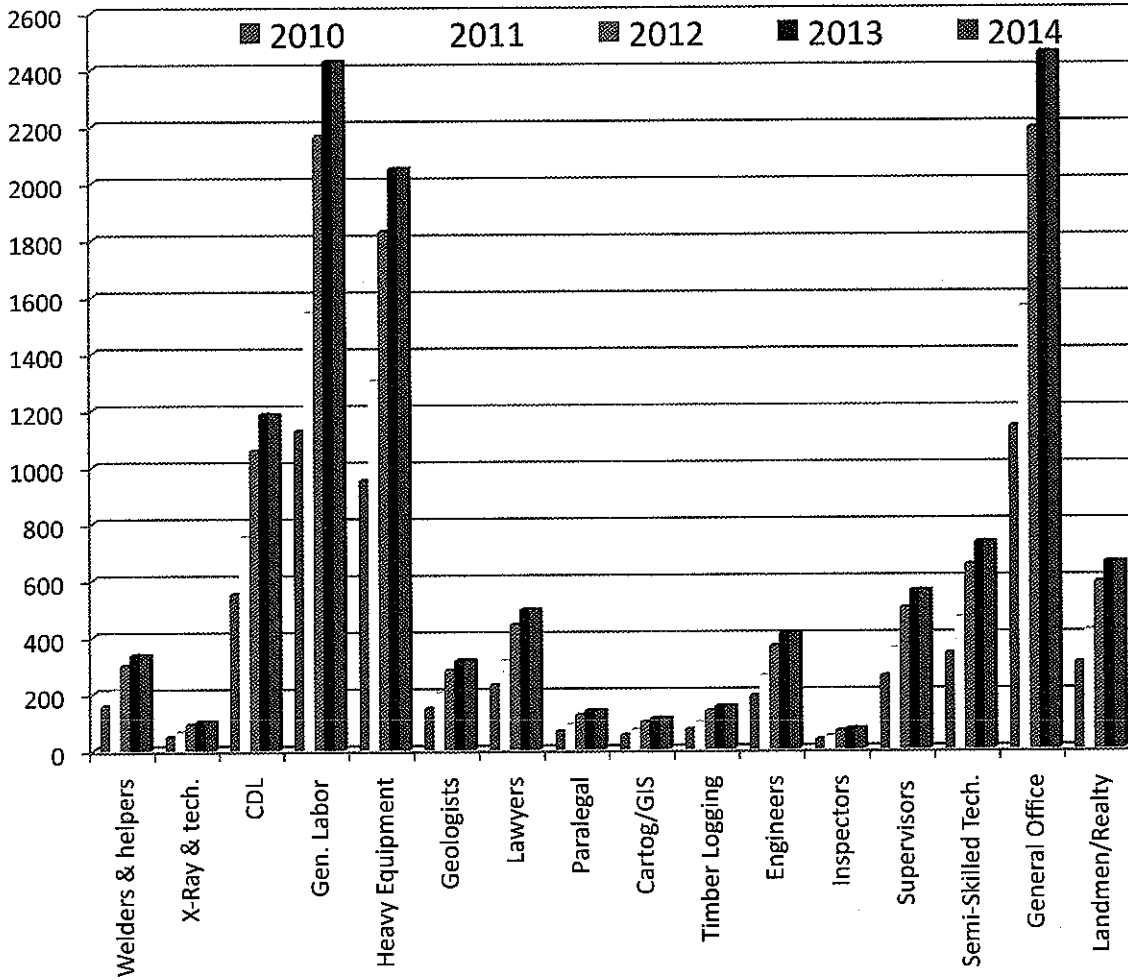


Figure 11: Estimated Occupational Requirements – High Scenario

Appendices

Pre-Drilling

Natural Gas Extraction
Education / Job Matrix
Pre-Drilling Phase

Pre-Drilling		Associated Jobs	
Geological Studies		Cartographer	
		Geologists & Geophysicists	
		GIS Technicians	
		Hydro Geologist	
		Petroleum Chemists	
		Petroleum Engineers	
	Seismic		CDL Drivers
			Helicopter Pilot/Crew
		Landman	
		Project Management	
		Seismic Crew	
Public Land Only		Archeologist	
		Biologist	
		Forester	
		Lawyers	
Mineral Rights		Water Management	
		Landman	
		Lawyers	
		Lease Administration	
		Lease Acquisition	
		Paralegal	
Permitting Process		Title-Abstract	
		Archeologist	
		Biologist	
		Community Affairs	
		Corporate Development	
		Environmental Technicians	
		Lawyers	
		Permitting Technician	
Staking the Well		Public Relations Division	
		Civil Engineer	
		Civil Engineering Technician	
		Heavy Equipment Maintenance Technician	
		Heavy Equipment Operator	
		Land Clearing	
		Lawyers	
		Leasing Agents (Right-of-Way)	
		Logging	
		Roadman	
		Surveyors	
Water Mgmt		Electricians	
		Environmental Compliance Coordinator	
		Hydrologist (Stream Monitoring)	
		Mechanics	
		Private Water Supply Testing Coordinator	
		Water Management Technician	
		Water Transfer/Driver CDL	
	Welders		
Over-all		Human Resources	

Drilling

Natural Gas Extraction Education / Job Matrix Drilling Phase

	Associated Jobs
	Boring Crew
	Civil Engineer
	Environmental Compliance Coordinator
	Environmental Technician-Monitor Reclamation
	Foreman
	General Labor
	Heavy Equipment Operator
	Landman
	Logging
	Mechanical Engineering
	Petroleum Engineers
	Pipe Fitters
	Safety Coordinator
	Superintendent
	Surveyors
	Weld Inspectors
	Welder Helpers
	Welders
	X-Ray
	X-Ray Technician
	Construction Managers
	Foreman
	General Labor
	Land Clearing
	Pipeline Inspection
	Welder Helpers
	Welders
	X-Ray
	X-Ray Technician
	Electricians
	Engineers
	General Construction
	Pipeline
	Welders
	Well Tenders/Roustabout

Continued on next page

Natural Gas Extraction
Education / Job Matrix
Drilling Phase (Continued)

Drilling	Associated Jobs
	CDL Drivers
	Company Man/Geologist
	Diesel Technicians
	Drilling Engineer
	Drilling Superintendent
	Electricians
	Environmental Compliance Coordinator
	Flaggers
	Heavy Equipment Operator
	Light Truck Delivery
	Machine Shop
	Mudmen
	Pilot Drivers
	Rig Move
	Roughnecks
	Roustabouts
	Safety Coordinator
	Security
	Surveyors
	Tool Pushers
	Welders
	Casing Crew
	CDL Drivers
	Cement Pumpers
	Crane Operations
	Directional Drilling
	E-Technicians
	Electricians
	Engineers
	Environmental Compliance Coordinator
	Finishing Rig
	Foreman
	Frac Crew
	Heavy Equipment Maintenance Technician
	Heavy Equipment Operator
	Mechanics
	Perforators
	Petroleum Engineers
	Roustabouts
	Safety Coordinator
	Site Management
	Supervisors
	Well Logging

Continued on next page

Natural Gas Extraction
Education / Job Matrix
Drilling Phase (Continued)

Drilling	Associated Jobs
	Completion-Xaferers
	Engineers
	Environmental Compliance Coordinator
	Flowback Analyzer
	Hydrologist/Water Supervisor
	Inspectors
	Safety Coordinator
	Water Transfer/CDL Driver
	Water Re-Use Supervisor
	Water Re-Use Technician
	Water Testing/Quality
	Accountants
	Calibration Technician
	CDL Drivers
	Clerks/Data Entry/Reception
	Environmental Compliance Coordinator
	Field Representatives
	Financial/Business Management
	First Aid
	Fleet Managers
	Flowback
	Heavy Equipment Operator
	Human Resources
	IT Technicians
	Local Liaison
	Lunch Wagon
	MSHA Compliance
	MSHA Training
	Noise Abatement
	Office Management
	Office Support - Administrative Assistant
	OSHA Compliance
	OSHA Training
	Public Affairs
	Purchasing
	Road Crews
	Safety Coordinator
	Security
	State Law Compliance
	State Law Training
	Surveyors
	Trainers for On-the-Job Training

Production/Reclamation

Natural Gas Extraction
Education / Job Matrix
Production/Reclamation Phase

Production/ Reclamation		Associated Jobs
Natural Gas Production		Communications Technician Offsite Monitoring
		Compressor Operator
		Equipment Calibration
		Gas Control Center
		Gas Dispatcher
		Gathering Operations
		Heavy Equipment Maintenance Technician
		Operator
		Petroleum Engineers
		Production Engineer
		Production Foreman
		Service Rig Operator
		Well Tenders/Roustabout
		Reclamation
Civil Engineer		
Environmental Health & Safety		
General Construction		
Government Officials		
Heavy Equipment Operator		
Landscapers-Architect		
Plugging Crew		
Site Management		
Business Development/Sales		
Overall		Calibration Technician
		CDL Drivers
		Corrosion Technicians
		Environmental Health & Safety
		Fleet Managers
		Human Resources
		Inspectors
		IT Technicians
		Lobbying
		Local Liaison
		Marketing
		Noise Abatement
		Office Management
		Office Support-Administrative Assistant
		Public Relations Division
		Purchasing
Sewage Treatment		

Continued on next page

**Natural Gas Extraction
 Education / Job Matrix
 Production/Reclamation Phase (Continued)**

Production/ Reclamation		Associated Jobs
High-BTU Gas/Gas Processing		Bi-Product Marketing/Sales
		Bi-Product Transportation
		Compressor Operator
		Facility Construction
		Gathering Operations
		Information Science Technology
		Instrumentation/Reader Technicians
		IT Technicians
		IT Trainers
		Pigging Technicians
		Pipeline Operators
		Pipeline Technicians
		Processing Engineers
		Processing Loader/Testers
		Processing Maintenance/Mechanics
		Processing Operators
	Processing Supervisors/Managers	

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<http://www.alleghenyconference.org/PEL/PDFs/EconomicImpactOilGasInPA1108.pdf>.

History of the Marcellus Shale Education & Training Center

The Marcellus Shale Education & Training Center (MSETC) concept originated in late summer of 2008 and officially opened in January 2009. The MSETC is collaboration of Workforce Development & Continuing Education at Pennsylvania College of Technology and Penn State Cooperative Extension. The mission of the MSETC is to provide both the regional community and the natural gas industry with a central resource for workforce development and community education needs related to Marcellus Shale gas. The MSETC serves as a central resource for training and curriculum that is specific to the development of this natural resource. In addition, the MSETC has the capacity to deliver training at multiple locations throughout the Commonwealth to satisfy the needs of the industry.

The central operation of the MSETC is located in the Center for Business & Workforce Development on the campus of Pennsylvania College of Technology in Williamsport, PA. The MSETC is able to utilize the institutional infrastructure of both The Pennsylvania State University system as well as Penn College. In addition, through the Workforce and Economic Development Network of Pennsylvania (WEDnetPA), MSETC also has delivery and infrastructure capacity through WEDnetPA's 33 partner institutions including community colleges and the various universities in the Pennsylvania State System of Higher Education system.

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

West Virginia Code §5A-3-10a states: No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owed is an amount greater than one thousand dollars in the aggregate.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Debtor" means any individual, corporation, partnership, association, limited liability company or any other form or business association owing a debt to the state or any of its political subdivisions. "Political subdivision" means any county commission; municipality; county board of education; any instrumentality established by a county or municipality; any separate corporation or instrumentality established by one or more counties or municipalities, as permitted by law; or any public body charged by law with the performance of a government function or whose jurisdiction is coextensive with one or more counties or municipalities. "Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

EXCEPTION: The prohibition of this section does not apply where a vendor has contested any tax administered pursuant to chapter eleven of this code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

Under penalty of law for false swearing (*West Virginia Code §61-5-3*), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

WITNESS THE FOLLOWING SIGNATURE

Vendor's Name: WORLD CLASS INDUSTRIAL NETWORK, LLC

Authorized Signature: Silvio R. Duncan Baretta Date: 11/23/2010

State of Pennsylvania

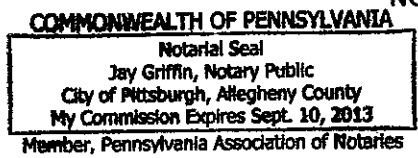
County of Allegheny, to-wit:

Taken, subscribed, and sworn to before me this 23 day of November, 2010

My Commission expires September 10th, 2013

AFFIX SEAL HERE

NOTARY PUBLIC



[Handwritten Signature]

State of West Virginia

VENDOR PREFERENCE CERTIFICATE

Certification and application* is hereby made for Preference in accordance with West Virginia Code, §5A-3-37. (Does not apply to construction contracts). West Virginia Code, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the West Virginia Code. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Resident Vendor Preference, if applicable.

- 1. Application is made for 2.5% resident vendor preference for the reason checked: Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; or, Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or, Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; or,
2. Application is made for 2.5% resident vendor preference for the reason checked: Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
3. Application is made for 2.5% resident vendor preference for the reason checked: Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
4. Application is made for 5% resident vendor preference for the reason checked: Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; or,
5. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked: Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; or,
6. Application is made for 3.5% resident vendor preference who is a veteran for the reason checked: Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (West Virginia Code, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: _____ Signed: _____
Date: _____ Title: _____

*Check any combination of preference consideration(s) indicated above, which you are entitled to receive.