Current Staffing and Support:

The Division of Energy, Mineral, and Land Resources' (DEMLR) Energy Program is currently staffed with a Program Supervisor, a Senior Environmental Specialist, a Senior Geologist/Hydrogeologist, and an Administrative Support Specialist. All personnel are located in the DEMLR central office in Raleigh, N.C. This Program is supported with nearly $350,000 in annual funding, along with around $18,000 of non-recurring funds. Respective monies cover employee salaries and benefits, travel, basic DEMLR-issued safety equipment (i.e hard hats, safety glasses, and steel toe boots), and other operational needs. Refer to **Tables Y-1** and **Y-2** for specifics.

Future Staffing and Support:

Determining the future staffing needs is difficult at best, as estimating Energy Program workload is dependent on predicting the volume of future oil and gas activity in the state. Additionally, while the Energy Program is developing rules and policy to address state-wide operations, resources that are most likely to be exploited in the short term involve shale gas within the State's Triassic Basin areas. As a result, future staffing requirements addressed in this report assume a scenario where Triassic shale resources are explored, proven, and exploited, before other areas of the State (i.e. Coastal Plain) are seriously considered by industry.

The Energy Program would need to grow from its current staffing level of four to a total of 13 personnel to permit, oversee, and regulate expected oil and gas activities. These positions would include one Program Supervisor, three Senior Environmental Specialists, two Environmental Specialists, one Senior Geologist/Hydrogeologist, one Administrative Support Specialist, one Engineer, one Rules Coordinator, one Economist, one Public Information Specialist, and one Business Application Technology Specialist. Nine of these members would remain in the Raleigh Central Office to provide technical and administrative oversight and management. However, a team each comprised of one Senior Environmental Specialist and two (junior) Environmental Specialists would likely be assigned to DEMLR's Winston-Salem Regional Office and to the Fayetteville Regional Office. Members based within Regional Offices would provide local regulation and oversight to industry field operations.

Equipment Needs:

Ensuring the proper permitting and regulatory compliance of oil and gas operations will necessitate special equipment and training for Energy Program members. Personal protective equipment would not be limited to the standard DEMLR issued items; staff would also require

fire retardant clothing. Specialized field equipment would include water "multi-meters" for measuring field parameters within surface water bodies or water wells, cement scales for determining drilling fluid and cement density, in addition to portable gas meters to help ensure site safety.

Training:

Oil and gas operations involve the application of cutting-edge scientific and engineering technology. As a result, Energy Program personnel must attend annual professional training to remain up to date on the most current industry capabilities and trends. Additionally, initial and annual safety training related to oil and gas operations is essential to ensure proper regulatory oversight and staff safety.

Summary of Expected Future Costs:

Future annual recurring costs to support the Energy Program would be nearly $1.1 million, in addition to non-recurring equipment costs of nearly $100,000. These monies would address the specific needs which have already been noted, as well as employee salaries and benefits, travel, and other requirements. Refer to **Tables Y-3** and **Y-4** for more detailed information.

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Table Y-1. Energy Program: Current and Estimated Annual Costs.

Cost Impact	Amount per year	Notes
Salary and Support	$304,000	Employees include: Program Supervisor, Geologist, Senior Specialist, and Administrative Assistant. (Four employees)
Office Supplies	$200	Assume $50 per person.
Office Space (Rent)	---	Rent is not paid for offices in the Archdale Building.
Office Space (Operating)	$5,200	Includes copier use, internet access, phone use, etc. Amount based on expansion budget figures of about $1,300 per person.
Personal Protective Equipment	$1,500	Estimated based on a standard amount of $500 per operational person per year.
Professional Training	$2,000	Estimated based on a standard amount of $500 per person per year. Includes registration fees for locally-sponsored training.
Computer Software and Training	$1,000	Estimated based on a standard amount of $250 per person per year.
Cell Phone	$200	The program has one cell phone total.
Vehicle Use (Rented)	$11,000	Rental cost for one vehicle, based on minimal mileage use (1050 miles/month).
Travel	$7,200	Assumes 5,000 miles at $0.48/mi for each operational employee. Thus 15,000 miles total.
Meals	$1,636	$36.35/dy for 15 days/yr per operational employee. Thus, 45 days total.
Lodging	$2,966	$65.90/dy for 15 days per operational employee. Thus, 45 days total.
Miscellaneous Travel Expenses (Parking fees, tolls, etc.)	$600	Based on estimated amount of $200 per operational person per year.
Public Meeting Advertising	$8,250	15 Advertisements at $550 per advertisement.
Postage	$5,000	
Total	**$348,952**	

Table Y-2. Energy Program: Current Estimated Non-Recurring Costs.

Cost Impact	Amount	Notes
Computers (hardware)	$6,000	Based on about $1,500 per computer and associated hardware. Assume a five year lift.
Office Equipment	$11,600	Bookcases, desks, whiteboards, office chairs, etc. Estimated based on a standard rate of $2,900 per person.
Total	**$17,600**	

Table Y-3. Energy Program: Future Estimated Annual Costs.

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Cost Impact	Amount per year	Notes
Salary and Support (13 Total Employees, which already includes the four current employees.)	$908,432	Central Office: 1 Supervisor, 1 Geologist, 1 Engineer, 1 Senior Specialist, 1 Administrative Assistant, 1 Rules Coordinator, 1 Economist, 1 Public Information Specialist, 1 Business Application Technology Specialist. Regional Office (WSRO?): 1 Senior Specialist, 1 Environmental Specialist. Regional Office 2 (Fayetteville/Raleigh?): 1 Senior Specialist, 1 Environmental Specialist. (Note: assignment of RO personnel will depend on the location of future operations. Coastal Plain exploration may require additional specialists for the Washington RO.)
Office Supplies	$650	Assume $50 per person.
Office Space (Rent)	$14,124	Amount based on the Winston-Salem Regional Office (WSRO) rate of $3531/yr. per position. Four (4) positions will be in ROs
Office Space (Operating)	$35,452	Includes copier use, internet access, phone use, etc. Amount based on the WSRO rate of $5,938/yr. per position and the Archdale rate of $1,300 per person.
Personal Protective Equipment	$10,500	Includes fire retardant PPE specifically designed for oil and gas operations. Estimated based on bi-annual purchases of averaging about $1,000 per year operational per employee (8). Also allot for $500 per year for other employees (5).
Professional Training	$13,000	Estimated based on an amount of $1,000 per person per year, due to specialized training related to the oil and gas industry. Includes registration fees for locally-sponsored training.
Computer Software and Training	$3,250	Estimated based on a standard amount of $250 per person per year.
Cell Phone	$600	Cost will cover seven cell phones: Two at each Regional Office (RO) and one for the Central Office (CO).
Vehicle Use (rented)	$15,120	Rental cost for one vehicle, based on minimal mileage use (1050 miles/month at $0.40 per mile). Three rental vehicles are proposed: one for each RO and a third for the CO.
Travel	$19,200	Assumes 5,000 miles at $0.48/mi for each operational employee (8 positions). Assumes that non-operational employees can travel with operational employees. Thus 40,000 miles total.
Meals	$7,088	$36.35/dy for 15 days/yr per employee (13 positions). Thus, 195 days total.
Lodging	$12,850	$65.90/dy for 15 days per employee (13 positions). Thus, 195 days total.
Misc. Travel Expenses (parking fees, tolls, etc.)	$2,600	Based on estimated amount of $200 per person per year (13 people).
Public Meeting Advertising	$8,250	15 Advertisements at $550 per advertisement.
Postage	$5,000	
Field Sampling	$15,000	Ability to perform random or "on-call" sampling to ensure human health and environmental protection. Cost per sample depends on the analyses performed and the laboratory conducting analyses.
State-Owned Vehicle Maintenance	$12,000	Basic maintenance and repairs over a 10 year life span. Also includes fuel costs.
Total	**$1,083,116**	

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Table Y-4. Energy Program: Future Estimated Non-Recurring Costs.

Cost Impact	Amount	Notes
Computers (hardware)	$12,000	Based on about $1,500 per computer and associated hardware. Assume a five year life. Eight additional employees will need this equipment.
State-Owned Vehicle	$50,000	4 X 4 Truck (estimated State contract cost). Each regional office should have one truck.
Field Equipment	$10,000	Groundwater multi-meters ($2,500 each, with one at each RO), GPS units, gas meters (one per Env. Specialist), mud balance/cement scale ($300 each, one per Env. Specialist), buckets, shovels, etc. Total up front cost is about $10,000. Assume five-year service life.
Office Equipment	$23,200	Bookcases, desks, whiteboards, markers, etc. Estimated based on a five-year life of these items. Up front cost for one employee is about $2,900. Nine additional employees will need this equipment.
Total	**$95,200**	

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Bonding:

Within the general statutes of the Oil and Gas Conservation Act, amended and rewritten by Session Law 2012-143, there are a number of areas where an oil or gas permittee is required to furnish a bond or provide compensation for damages incurred to surface land owners. The operator is required under § 113-378 to furnish a bond for well plugging and abandonment. Under § 113-421 an operator is to provide compensation for damages to a water supply, personal property, and to market resources like timber, livestock, and crops if the land owner is not also the permittee. On direction from the Study Group, DEMLR staff compiled **Table X-1** to show the different bonding types and practices seen in other oil and gas producing states.

Surface Owner Bonding:

Under § 113-421 (a1)(1-3) the permittee is to provide compensation for damages to a water supply, personal property, and to market resources such as timber, livestock, and crops. The study group researched surface owner bonding practices of other states and Federal agencies; see **Table X-2**.

The Study Group determined that there should be some level of protection for affected land owners and shall be addressed in lease negotiations.

Geophysical Exploration Bonding:

DEMLR staff researched and provided information to the Study Group related to bonding for geophysical activities in North Carolina and in other states. Overall, geophysical bonding addresses two primary classifications, designated as explosive and non-explosive exploration. Bonding ranges from $25,000 to $250,000 in states that regulate exploration activity, **Table X-3**.

The recommendation of the Study Group is that a blanket bond of $50,000 be provided by any person or company seeking to perform any type of geophysical exploration in the state of North Carolina. If the person or company hires out or subcontracts any work, the subcontractor shall be covered under the $50,000 bond provided.

Well Plugging and Abandonment Bonding:

Currently under § 113-378 an operator is required to submit a bond in the amount of $5,000, plus $1.00 for each linear foot proposed to be drilled for the well. Proper plugging, cementing, and abandonment of an oil or gas well is a complex procedure that should only be performed by competent oil and gas professionals.

Based on a cost estimate provided by Halliburton Corporation (**Figure X-1**), the Study Group recommends a bonding amount of $27.00 per foot of well that will be filled with cement in accordance with North Carolina well abandonment rules.

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Site Reclamation Bonding:

Currently the Mining Section of DEMLR uses a table where the acreage of different land uses associated with a mine and costs are used to determine the appropriate bond amount that a mining operator would need to secure prior to receiving an approved mining permit. The land uses range from haul roads, pits, to stockpiles.

The recommendation of the Study Group is that the Mining and Energy Commission adopt a similar table for calculating the site reclamation bond. Staff prepared an example using acreage from an oil and gas permit from another state to determine what potential costs of reclamation would be; see **Table X-4**. The costs in the table for the different land use categories represent an estimate from various sources, including NCDOT.

Types of Allowed Bonds:

The recommendation of the Study Group is to accept the same types of bonds, or assurances, that the Mining Programs accepts. This is due to the Department and the industries familiarity with the program.

The current procedure under the Mining Programs is that the applicant must use the Department's standard forms when completing the bond forms for surface owner, site reclamation, and well plugins and abandonment. The name on the bond, assignment of savings account, or irrevocable letter of credit form must be the same as the name of the company or individual that the application for oil and gas permit was filed under.

For example: An application is filed by Mr. John Q. Public, under the company name of Oil and Gas Company; therefore, the security must be in the name of Oil and Gas Company. An exception to this would be for Mr. Public to have the security form filled out to read John Q. Public d/b/a (doing business as) Oil and Gas Company. This way the mining permit could be issued in the name of Oil and Gas Company and Mr. Public could have his name listed on any other financial documents. See **Table X-5** for a breakdown of advantages and disadvantages of each bond type allowed.

1. Assignment of Savings Account:
   A. These are issued by an acceptable banking institution licensed to do business in North Carolina. The applicant and an authorized agent for the bank must sign the form and both signatures must be notarized.
   B. “Savings Account" refers to any savings instrument not just a passbook account. A money market account or certificate of deposit can also be utilized. Whatever savings instrument is chosen, the original or photocopy of the document issued by the bank (passbook, deposit receipt, actual certificate of deposit) must be attached to the original assignment form and both forwarded to the DENR-LQS Central Office.
   C. The account numbers and dollar amounts listed on the assignment form must match those on the savings instrument.

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2. Surety Bonds: These are issued by an issuance company licensed to do business in North Carolina. A Power of Attorney must accompany the completed original standard bond form provided by the Department to substantiate that the issuing agent has authorization to act on behalf of the insurance company.

3. Bank Guaranty: These guaranties of payment must be issued from an acceptable bank licensed to do business in North Carolina.

4. Cash Deposits: Cashiers or certified checks must be made payable to the North Carolina Department of Environment and Natural Resources. A cover letter specifying the intended function of the money being submitted to the Department must accompany the check.

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HALLIBURTON

Cost Estimate ***Cement PTA***

Mtrl Nbr	Description	Qty	U/M	Unit Price	Gross Amt	Net Amt
1	ZI-MILEAGE FROM NEAREST HES BASE,/UNIT	1500	MI	9.79	14,685.00	8,811.00
	Number of Units	1				
2	MILEAGE FOR CEMENTING CREW,ZI	1500	MI	5.76	8,640.00	5,184.00
	Number of Units	1				
16094	PLUG BACK/SPOT CEMENT OR MUD,ZI	1	EA	6,626.00	6,626.00	3,975.60
	DEPTH	2550				
	FEET/METERS (FT/M)	FT				
114	R/A DENSOMETER W/CHART RECORDER,/JOB,ZI	1	JOB	1,285.00	1,285.00	771.00
	NUMBER OF UNITS	1				
119534	SUCTION HOSE, 4"/FT W/HES,PER JOB ZI	200	FT	4.40	880.00	528.00
	NUMBER OF JOBS	1				
14089	PUP TRAILER,NON-ACID MATLS,0-8 HRS,ZI	1	EA	822.00	822.00	493.20
	HOURS (MIN8)	8				
100003687	PREMIUM CEMENT	400	SK	53.28	21,312.00	12,787.20
3965	HANDLE&DUMP SVC CHRG, CMT&ADDITIVES,ZI	400	CF	5.49	2,196.00	1,317.60
	NUMBER OF EACH	1				
	Unit of Measurement					
76400	ZI MILEAGE,CMT MTLS DEL/RET MIN	750	MI	3.35	47,235.00	28,341.00
	NUMBER OF TONS	18.8				
7	ENVIRONMENTAL SURCHARGE,/JOB,ZI	1	JOB	134.00	134.00	134.00
372867	Cmt PSL - DOT Vehicle Charge, CMT	1	EA	241.00	241.00	241.00
11881	ZI OVERWEIGHT PERMIT FEE-CEMENTING	1	EA	60.00	60.00	60.00
86955	ZI FUEL SURCHG-HEAVY TRKS >1 1/2 TON	1500	MI	0.72	1,080.00	1,080.00
	Number of Units	1				
86954	ZI FUEL SURCHG-CARS/PICKUPS<1 1/2TON	1500	MI	0.24	360.00	360.00
	Number of Units	1				
87605	ZI FUEL SURCHG-CMT & CMT ADDITIVES	750	MI	0.24	3,384.00	3,384.00
	NUMBER OF TONS	18.8				
	Total	**USD**				**108,940.00**
	Discount	**USD**				**41,472.40**
	Discounted Total	**USD**				**67,467.60**

Primary Plant: Sandersville, MS, USA
Secondary Plant: Sandersville, MS, USA
Price Book Ref: 29 Southeast - NEW
Price Date: 3/20/2013

Mtrl Nbr	Description	Qty	U/M	Unit Price	Gross Amt	Net Amt
16092	ADDITIONAL HOURS (PUMPING EQUIPMENT), ZI	1	EA	1,139.00	1,139.00	797.30
	HOURS	1				
	UNIT OF MEASURE - HRS	H				
464256	CMT, Bulk Truck on loc, additional hours	1	EA	196.00	196.00	137.20
	HOURS	1				
	UNIT OF MEASURE - HRS	H				
10	FOOD AND LODGING, ZI	3	DAY	653.00	5,877.00	4,113.90
	NUMBER OF PERSONNEL ON JOB	3				

Primary Plant: Sandersville, MS, USA
Secondary Plant: Sandersville, MS, USA
Price Book Ref: 29 Southeast - NEW
Price Date: 3/20/2013

Figure X-1. Cost estimate breakdown from cement contractor for plugging of a 2,550 foot well in Lee County, NC.

Table X-1. State by state comparison of bonding practice and types.

	Cost of Bond	What is Being Bonded?	Type of Surety Allowed
Alaska	*Amount per well*: Not less than $100,000 (Based on the cost of abandonment and location clearance; may be less if the operator can prove that the cost for abandonment would < $100K) *Blanket bond*: Not less than $200,000.	Ensures proper construction, operation, maintenance, and abandonment; and that each location is cleared according to State rules.	Surety or a personal bond
Arizona	*Amount per well*: $10,000 for well depth to 10,000 ft; $20,000 for well depth > 10,000 ft. *Blanket bond*: $25,000 for 10 or fewer wells; $50,000 for between 10 - 50 wells; or $250,000 for 50+ wells.	Ensures proper construction, abandonment, plugging, repairing, and restoration of well site.	Surety bond executed by the operator (principal) and a corporate surety, authorized to work in AZ; Certified checks or CDs are acceptable.
Arkansas	*Blanket bond*: $25,000 for 1 to 25 wells; $50,000 for 60 to 100 wells; $100,000 for more than 100 wells.	Plugging, well repair, and well site restoration.	Surety bond, irrevocable letter or credit, CD, cash.
California	*Amount per well*: $15,000 for each well <5,000 ft deep; $20,000 for each well 5,000 to <10,000 ft; $30,000 for each well 10,000 ft. or greater. *Blanket bond*: (a) $250,000 (not including the idle well fee); (b) $100,000 for any operator with 50 or fewer wells in CA (not including the idle well fee); (c) $1,000,000 which does include the idle well fee. *Idle well fee or bond*: $100 for each well that has been idle for <10 yrs; $250 for each well idle for 10 to <15 yrs; $500 for each well idle for 15 yrs or more. May also be drawn off an established escrow account established by depositing $5,000 for each idle well.	Well construction, repair, re-drilling, plugging, and site restoration Also, a "life of production" or "life of well" facility bond may be required of operators with a history of violations. A facility bond will cover plugging and abandonment; decommissioning of facilities; financing of spill/incident response and remediation.	Cash or indemnity bond.
Florida	*Amount per well*: $50,000 for 0 to 9,000 ft; $100, 000 if 9,000 ft or greater. Amounts are doubled if well is successful. *Blanket bond*: $1,000,000 (10 well limit).	Plugging and/or site clean-up if the operator goes bankrupt	Bond, letter of credit, cash or asset deposit, and participation in Minerals Trust Fund.
Georgia	*Amount per well*: Flexible, up to $50,000 *Blanket bond*: $50,000 and adequate documentation of financial resources to plug wells.	Well plugging according to specifications.	Not specified
Idaho	*Amount per well*: $10,000 plus $1.00 per ft. *Blanket bond*: $50,000 (up to 10 wells); $100,000 (11 to 30 wells); $150,000 (more than 30 wells).	Well plugging, surface reclamation, protection of surface estate if separate from mineral estate.	Cash or surety bond.
Illinois	Amount per well: $1,500 (less than 2,000 ft); $3,000 (over 2,000 ft). *Blanket bond*: $25,000 (0 to 25 wells); $50,000 (26 to 50 wells); $100,000 (51 or more wells)	Penalty, plugging and restoration.	Surety letter, letter of credit, and certificate of deposit.
Indiana	*Amount per well*: $2,500 *Blanket bond*: $45,000	Plugging and abandonment of wells, restoration.	Surety bond, certificate of deposit, cash.

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	Cost of Bond	What is Being Bonded?	Type of Surety Allowed
Kansas	*Amount per well*: $0.75 times the aggregate depth for all wells drilled or operated. *Blanket bond*: Ranges from $7,500 to $45,000 depending on the number of wells and depth.	Plugging, restoration, and requirement by statute for an operator to receive a license.	Performance bond, letter of credit, fee, state lien on tangible personal property, other.
Kentucky	*Amount per well*: $500 (0 to 500 ft); $1,000 (501 to 1,000 ft); $1,500 (1,001 to 1,500 ft); $2,000 (1,501 to 2,000 ft); $2,500 (2,001 to 2,500 ft); $3000 (2,501 to 3,000 ft); $3,500 (3,001 to 3,500 ft); $4,000 (3,501 to 4,000 ft); $5,000 or other amount set by the Oil and Gas Commission (over 4,000 ft). *Blanket bond* (for "qualified" operators): $10,000 (1 to 25 wells); $25,000 (25-100 wells); $50,000 (100 to 500 wells); $100,000 (over 500 wells). *Blanket bond* (for "unqualified" operators): $50,000 (1 to 100 wells); $100,000 (over 100 wells).	Compliance purposes – plugging.	Cash, letter of credit, surety, and certificates of deposit
Louisiana	*Amount per well* (land-based): $1.00 per ft (less than 3,000 ft depth); $2.00 per ft (3,001 to 10,000 ft); $3.00 per ft (over 10,001 ft). *Amount per well* (inland water): $8.00 per ft. *Amount per well* (water): $12.00 per ft. *Blanket bond* (land): $25,000 (0 to 10 wells); $125,000 (11 to 99 wells); $250,000 (over 100 wells). *Blanket bond* (inland water): $125,000 (0 to 10 wells); $625,000 (11 to 99 wells); $1,250,000 (over 100 wells). *Blanket bond* (water): $250,000 (0 to 10 wells); $1,250,000 (11 to 99 wells); $2,500,000 (over 100 wells).	Plugging and restoration.	Certificate of deposit, performance bond, letter of credit.
Maryland	*Amount per well*: no minimum, $100,000 maximum. *Blanket bond*: no minimum, $500,000 maximum.	Plugging and site restoration.	Surety bonds, cash, letters of credit, certificates of deposit.
Michigan	*Amount per well:* dependent on well depth, ranges from $10,000 to $30,000. *Blanket bond*: dependent on well depth, ranges from $100,000 to $250,000.	Well plugging and site restoration.	Conformance bond, letter of credit, cash, certificate of deposit.
Missouri	*Amount per well:* $1,000 (0 to 500 ft); $2,000 (501 to 1,000 ft); $3,000 (1,001 to 2,000 ft); $4,000 (2,001 to 5,000 ft); $4,000 + $1.00 per ft (5,001 ft and deeper). *Blanket bond*: $20,000 (0 to 800 ft) for 50 wells; $30,000 (801 to 1,200 ft) for 15 wells.	Plugging, abandonment, and site restoration.	Surety bond, personal bond, letter of credit.
Nebraska	*Amount per well:* Currently $5,000 but will increase to $10,000 *Blanket bond*: Currently $25,000 but will increase to $100,000.	Plugging, abandonment, and site restoration.	Insurance or certificate of deposit.
Nevada	*Amount per well:* $10,000. *Blanket bond*: $50,000.	Plugging and abandonment	Corporate surety licensed to do business in Nevada.

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	Cost of Bond	What is Being Bonded?	Type of Surety Allowed
New Mexico	*Amount per well:* $5,000 + $1.00 per ft in major producing counties; $10,000 + $1.00 per ft for wells located elsewhere. *Blanket bond*: $50,000, but single well bond may be required in addition to the blanket bond for wells inactive for more than 2 years.	Plugging, abandonment, restoration, and remediation.	Surety shall be a reputable corporate surety authorized to do business in New Mexico.
North Dakota	*Amount per well:* $50,000 except that wells drilled to 2,000 ft or less may be bonded in a lesser amount. Commercial disposal wells are bonded at $50,000 each. *Blanket bond*: $100,000 (more than 1 well). Limited to cover no more than 6 unplugged dry holes, plugged wells with site not reclaimed, and/or abandoned wells. This bond does not cover commercial disposal wells.	Drilling, plugging, and restoration.	Collateral bond, self-bond, cash, or any alternative form of security approved by the commission.
Oklahoma	*Amount per well:* Based on cost of plugging and abandonment of each well. If statewide plugging liability is less than $25,000, surety can be in the form of Category B. Blanket bond: $25,000 (Category B); $50,000 (Category A).	Drilling, operation, plugging, and restoration.	*Category A*: Financial statement showing net worth of $50,000 or greater. *Category B*: Corporate surety bond, irrevocable commercial letter of credit, bank joint custody receipt, certificate of deposit, cashier's check, cash, or other negotiable instrument.
Oregon	*Amount per well:* $10,000 (less than 2,000 ft); $15,000 (2,000 ft to 5,000 ft); $25,000 (deeper than 5,000 ft). *Blanket bond*: $100,000 minimum and must equal the individual well bond amounts. *Seismic bond*: $50,000, but may be waived if a blanket bond is in place.	Compliance with rules and regulations of the State of Oregon.	Not specified

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	Cost of Bond	What is Being Bonded?	Type of Surety Allowed
Pennsylvania	*Amount per well (conventional wells):* $2,500 per well. *Blanket bond (conventional wells)*: $25,000 for all wells. *Unconventional wells bond (wells with total bore length less than 6,000 ft)*: Operating up to 50 wells, $4,000 per well, but no bond may exceed $35,000; Operating 51 to 150 wells, $35,000 plus $4,000 per well for each well in excess of 50 wells, but no bond may exceed $60,000; Operating 151 to 250 wells, $60,000 plus $4,000 per well for each well in excess of 150 wells, but no bond may exceed $100,000; Operating more than 250 wells, $100,000 plus $4,000 per well for each well in excess of 250 wells, but no bond may exceed $250,000; *Unconventional wells bond (wells with total well bore length of 6,000 ft or greater)*: Operating up to 25 wells, $10,000 per well, but no bond may exceed $140,000; Operating 26 to 50 wells, $140,000 plus $10,000 per well for each well in excess of 25 wells, but no bond may exceed $290,000; Operating 51 to 150 wells, $290,000 plus $10,000 per well for each well in excess of 50 wells, but no bond may exceed $430,000; Operating more than 150 wells, $430,000 plus $10,000 per well for each well in excess of 150 wells, but no bond may exceed $600,000.	Plugging, abandonment, and restoration.	Any method is allowed, as long as the surety complies with the respective bonding statute (58 P.A.C.S. 3225).
South Dakota	*Amount per well:* $5,000 for plugging and performance; $2,000 for surface restoration. *Blanket bond*: $20,000 for plugging and performance; $10,000 for surface restoration.	Proper plugging and surface restoration.	Corporate surety bond, certificate of deposit, letter of credit.
Tennessee	*Amount per well*: $2,000 for 0 to 2,500 ft; $3,000 for 2,501 ft to 5,000 ft; $1.00 per foot for any well drilled deeper than 5,000 ft. *Blanket bond*: $20,000 for 10 wells drilled form 0 to 5,000 ft; $30,000 for 10 wells from 5,001 ft to 10,000 ft; No blanket bonds for wells deeper than 10,000 ft.	Proper plugging of wells, closure of pits, and cleanup of leases and other facilities.	Individual performance bond; blanket performance bond; letter of credit; cash deposit; or individual well plugging insurance policy.
Texas	*Amount per well*: $2.00 per foot for each well, excluding wells covered by plugging insurance. *Blanket bond*: At least the base amount or $25,000, whichever is greater. Base amounts determined as: 10 or fewer wells is $25,000; 10 to 99 wells is $50,000; 100 or more wells is $250,000. *Additional bond* (Operators of bay/near shore wells): $60,000, in addition to the other required bonds (above). *Additional bond* (offshore wells or combination of bay and offshore wells): $100,000, in addition to the other required bonds (above). *Note*: Reductions of "additional bonds" may be allowed by the State, if the operator can prove other means of financial assurance.	Proper plugging of wells, closure of pits, and cleanup of leases and other facilities.	Individual performance bond; blanket performance bond; letter of credit; cash deposit; or individual well plugging insurance policy.

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	Cost of Bond	What is Being Bonded?	Type of Surety Allowed
Virginia	*Amount per well*: An amount sufficient for plugging and site restoration not less than $10,000 per well plus $2,000 per acre of disturbed land. *Blanket bond*: $25,000 (1 to 15 wells); $50,000 (16 to 30 wells); $75,000 (31 to 50 wells); $100,000 (51 or more wells).	Plugging and restoration	Certificate of deposit, cash, other surety bonds acceptable by the State.
Washington	*Amount per well*: Not less than $50,000 *Blanket bond*: Not less than $250,000	Proper well abandonment and site reclamation.	Not specified
West Virginia	*Amount per well*: $5,000 per vertical well; $50,000 per horizontal well. *Blanket bond*: $50,000 for multiple vertical wells; $250,000 for multiple horizontal wells.	Plugging and site reclamation	Not specified
Wyoming	*Amount per well*: $10,000 for each well less than to equal to 2,000 ft; $20,000 for each well deeper than 2,000 ft. *Blanket bond*: $75,000 *Idle well bond*: $10.00 per ft.	Plugging and restoration, also includes seismic operations, well operation, well abandonment, idle wells, and pits.	Not specified

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Table X-2. Comparison of surface land owner bonding.

Comparison of Surface Owner Bonding	
State	**Bonding Specifics**
Colorado	$2,000 per well for non-irrigated land, $5,000 per well for irrigated land Optional $25, 000 statewide blanket bond The operator can still be held liable for damages exceeding the financial assurance.
New Mexico (proposed legislation)	Requires financial assurance agreement between a surface owner and the operator -OR- Binding Arbitration Agreement -OR- Requires compensation for a land tenant in accordance with incurred damages.
North Dakota	Oil and gas developers must pay for incurred damages.
Oklahoma	Requires agreement between the operator and the surface owner -OR- State will appoint appraisers, through the court system, to determine damages.
Wyoming	$2,000 per well site -OR- The Commission may establish an alternate blanket bond for the owner's land.
Bureau of Land Management	Based on an agreement between the lessee (operator) and surface owner -Or- Mandatory Bonding, depending on laws related to the respective land; minimum bond is $1,000.

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Table X-3. Comparison of bonding practices for geophysical exploration.

State	Rule	Requirement	Forms	Fees & Bonding
Colorado	Rule 333 (seismic operations)	**Form 3** and prove financial assurance in accordance with rule 705. Bond remains in effect until request is made by the company. Statewide blanket financial assurance of $25,000 required prior to commencing operations. 1. Shot holes have been properly plugged and abandoned and source/receiver lines have been reclaimed. 2. No outstanding complaints received from surface owners.	**Form 3**: Performance Bond	$25,000 statewide blanket bond
Arkansas	Rule B-42 (seismic)	The amount of the financial assurance shall be determined by the Director based on, but not limited to, the proximity of the seismic shoot to populated areas, cultural features, sensitive environmental areas, and past Commission enforcement history against the applicant.	**Form 19B**: Seismic Bond	Application fee for seismic operations is $500. Bond will be a minimum of $50,000 but not more than $250,000. Financial assurance shall remain in effect for one year following the conclusion of all field seismic operations.
Ohio	N/A	The Division does not regulate seismic activity. Since the testing is an agreement between the company and the landowner, no permit is required.	N/A	N/A
Oklahoma	165:10-11-6 (bonding)	**Form 1006SB**: Surety Bond for Seismic Shot Hole Plugging within the State of Oklahoma. Before drilling shot holes a $50,000 bond must be posted.	**Form 1006SB**: Surety Bond for Seismic Shot Hole Plugging within the State of Oklahoma	$50,000 bond
North Dakota	43-02-12-03 (bonding)	Any person desiring to engage in geophysical exploration within the state must obtain from the secretary of state a certificate of authority to transact business.		Bonding: $50,000 if contractor intends to conduct shot hole operations, $25,000 for any other method of geophysical exploration. Each subcontractor shall carry a $10,000 bond. Permit fee = $100
Pennsylvania	25 PA Code Chapters 210 and 211	Pennsylvania Department of Environmental Protection (DEP) regulates the storage, handling, and use of explosives.	5600-PM-MR0021	No amount provided
U.S.	Code of Federal	BLM managed lands – party filing NOI will need a	**BLM Form 3150-4/FS**	No amount provided

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State	Rule	Requirement	Forms	Fees & Bonding
Department of the Interior – Bureau of Land Management (BLM) & U.S. Department of Agriculture – Forest Service (FS)	Regulations 43 CFR 3000 & 36 CFR 228 Subpart E; Onshore Oil & Gas Orders & Notices to Lessees (NTLs) – The Gold Book. BLM/WO/ST-06/021+3071/REV 07.	bond and geophysical operator will need a bond. FS managed lands – authorized officer decides whether bond is required.	**Form 2800-16** - Notice of Intent (NOI) and Authorization to Conduct Oil and Gas Geophysical Exploration Operations **BLM Form 3150-5/FS Form 2800-16a** - Notice of Completion (NOC) of Oil and Gas Exploration Operations	

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Table X-4. Proposed reclamation costs table constructed by staff.

Category	Affected Area	Unit	Reclamation Cost/Unit		Reclamation Cost
Topsoil Stockpiles	7,000	Cubic Yard	$3.50		$24,500.00
Stone Removal for Access Road & Well Pad (Does not include transportation and disposal cost)	6,220	Cubic Yard	$20.00		$124,400.00
Spreading Stockpiles and Berms to Prepare for Fine Grading (filling a 2 acre 15 foot deep pit)	50,000	Cubic Yard	$3.50		$175,000.00
Fine Grading (5 acres)	24,250	Square Yard	$1.15		$27,887.50
Seed & Mulch, Repair Seeding, & Fertilizing	9.2	Acre	$2,700.00		$24,840.00
Matting for Soil Cover (Straw/Wood)	1,345	Square Yard	$2.00		$2,690.00
Matting Permanent Soil Reinforcement (Poly)		Square Yard	$8.50		$0.00
Drainage Ditch Excavation		Cubic Yard	$9.00		$0.00
Borrow Excavation		Cubic Yard	$7.00		$0.00
			Subtotal removing road & pad		$379,317.50
Inflation based on life of permit at 2% annually			Inflation cost		$7,586.35
			Total		**$386,903.85**
			Subtotal leaving road & pad		$254,917.50
			Inflation cost		$5,098.35
			Total		**$260,015.85**
			Reclamation cost per acre removing road & pad		$41,230.16
			Reclamation cost per acre leaving road & pad		$27,708.42
			Total Land Distrubance	9.2 Acres	
			Access Road	1.1 Acres	
			Well Pad	3.5 Acres	

Access Road Construction	Cubic Yards
Aggregate Base	630
Course Aggregate	945
Subtotal Access Road	1575
Well Pad Construction	
Aggregate Base	1860
Course Aggregate	2785
Subtotal Well Pad	4645
Total Aggregate	6220

Table X-5. Comparison of bond types currently in use by other DEMLR sections.

Bond Type	How it Works	Advantages and Disadvantages
Assignment of Savings Account	The operator puts money into a bank account, CD, or other bank-based financial instrument. This money is "frozen" in the account until the bond is either released or used by DENR.	Advantages: **(1)** If the bank releases the bond money prematurely, the bank is still responsible for paying the bond. **(2)** The money is already set aside for bonding purposes before a project begins. **(3)** If the operator goes bankrupt, DENR can still access the bonding money using the Attorney's General Office. **(4)** The operator can collect and keep all interest on the money in the account. Disadvantages: **(1)** DENR must move quickly to obtain these funds if the operator goes bankrupt. Otherwise, other creditors might obtain the money first. **(2)** If the bank goes bankrupt, DENR must trace the money to whatever financial institution has taken over the account.
Surety Bonds	The operator pays a financial surety company a monthly bond premium to cover the respective bond. If the operator fails to make the payment, the bonding company must notify DENR at least 60 days before canceling coverage.	Advantages: **(1)** If the operation is limited in time duration, the operator does not have to pay for the entire bond up front, and may save money in the long term. **(2)** The bonding company provides a guarantee of payment. Disadvantages: **(1)** The operator cannot recover the premium costs. **(2)** Late payments to the bonding company prompt threats of canceling coverage, which costs DENR a lot of staff labor to either prompt the operator to maintain payments, or to process paperwork to recover the bond.
Bank Guaranty	The bank issues a guaranty of payment. In other words, a financial institution provides a letter to DENR stating that a given operator is "good" for the bond money. Obviously, this instrument is almost never used.	Advantages: **(1)** Bank guaranty that the bond will be covered. **(2)** Paperwork is easier to process, compared to other instruments. Disadvantage: DENR must move quickly to obtain funds if the operator goes bankrupt. Otherwise, other creditors might obtain money first.
Cash Deposits	A cashier's check or a certified check for the bonding amount is sent to DENR by the operator. (DEMLR's mining program discourages this instrument.)	Advantage: The money is "in-hand" and easily accessed by DENR. Disadvantages: **(1)** The operator gains no interest from the bonding money. **(2)** DENR staff labor is extensive, as checks must be processed and deposited in a State-maintained account. **(3)** Releasing the bond back to the operator takes considerable time (roughly two months).

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