

I. Introduction:

This study group report is in response to Senate Bill 820 from the North Carolina General Assembly's short session in 2012, which became Session Law 2012-143. The study is sanctioned under SECTION 2.(j) of that bill which states: "The Mining and Energy Commission, in conjunction with the Department of Environment and Natural Resources, the Department of Transportation, the North Carolina League of Municipalities, and the North Carolina Association of County Commissioners, shall identify appropriate levels of funding and potential sources for that funding, including permit fees, bonds, taxes, and impact fees, necessary to (i) support local governments impacted by the industry and associated activities; (ii) address expected infrastructure impacts, including, but not limited to, repair of roads damaged by truck traffic and heavy equipment; (iii) cover any costs to the State for administering an oil and gas regulatory program, including remediation and reclamation of drilling sites when necessary due to abandonment or insolvency of an oil or gas operator or other responsible party; and (iv) any other issues that may need to be addressed in the Commission's determination. Any recommendation concerning local impact fees shall be formulated to require that all such fees be used exclusively to address infrastructure impacts from the drilling operation for which a fee is imposed. The Commission shall report its findings and recommendations, including legislative proposals, to the Joint Legislative Commission on Energy Policy, created under Section 6(a) of this act, and the Environmental Review Commission on or before January 1, 2013" [subsequently changed to October 1, 2013].

Pursuant to the provisions of this session law, the Chairman of the Mining and Energy Commission (MEC) appointed MEC Commissioner Jane Lewis-Raymond to direct the work of this study group, to be assisted by Commissioner George Howard, Commissioner Vik Rao, and Commissioner Jim Womack. DENR professional staff assigned to assist in the preparation of the report included Katherine Marciniak as the primary contact with her counterparts in the Division of Energy, Minerals, and Land Use to assist as necessary. Several other state officials, association representatives, and private sector participants were appointed to be primary participants in the research and deliberation of this report. They included Jennifer Brandenburg (N.C. DOT), Judith Corley-Lay (N.C. DOT), Brandon Jones (N.C. DOT), Erin McGraw (N.C. DOT), Ward Lenz (Department of Commerce's State Energy Office), Johanna Reese (N.C. Association of County Commissioners), Kenneth Snead (N.C. Highway Patrol), and Erin Wynia (N.C. League of Municipalities).

The study group has completed extensive review and analysis of the oil and gas drilling cost experiences in a number of other states, with a heavy emphasis on states with comparable recent experiences (Arkansas and Pennsylvania in particular). This report addresses each of the requirements specified under section 2.(j) of Session Law 2012-143 in light of those experiences as well North Carolina's present readiness to regulate and administer this industry in the coming years. This report is crafted in such a manner as to follow the structure of the statutory language and identify each of the known and measurable costs we anticipate that state agencies and local jurisdictions may experience as the shale oil and gas industry matures in the Triassic basins across 14 counties in North Carolina. The report does not attempt to project the state and local costs associated with any expansion of the industry beyond those geographic regions.

The report fulfills the study group's statutory requirement to identify sources of revenues- including taxes, fees, and bonds -to accomplish full recovery for state and local costs. Recent legislative initiatives to create severance taxes that generate additional revenue streams beyond cost recovery were not mandated for this study and have not been included in the group's deliberations or recommendations.

II. Local Government Cost

It is anticipated that local governments will experience increased costs associated with:

- i. Transportation infrastructure upgrades & repair
- ii. Waste handling
- iii. Hazmat training
- iv. Emergency response
- v. Training of local government staff – tax assessors, registers of deeds, inspectors/code compliance officers
- vi. Increase in local government personnel or overtime needed – tax assessors, registers of deeds, well testers, inspectors/code compliance officers

Some of these increased costs may be recovered by a growing property tax base, however other costs could be beyond that for which local government funds can be available or simply may be unforeseen. For these reasons, the Study Group recommends an impact fee be assessed and a process established whereby local governments experiencing increased costs can apply for funds to cover said costs with appropriate justification.

A. Potential Costs Other Than Those Associated With Transportation Infrastructure

To be filled in when get work from Joanne

B. Impact Fees As Cost Recovery Mechanism

Early discussions among the Study Group focused on how best to meet the cost needs of local governments from the establishment and operation of a hydraulic fracturing industry in North Carolina. The Study Group examined other states' cost recovery mechanisms, many of which rely on severance taxes and bonds, or localized fee structures. This localized model of each individual government assessing an impact fee on businesses operating within its jurisdiction was determined by the Study Group to be impractical and potentially duplicative in its implementation, as impacts to each government would vary drastically, particularly considering that municipalities, but not counties, would be responsible for damage to transportation infrastructure.

Alternatively, the Study Group determined that the best means by which to allow for otherwise uncovered costs was to assess an impact fee at the state level. The Study Group further studied the basis for such a fee and determined that tying the fee to the price of natural gas or the actual production volumes from a given well did not fairly account for the actual impact of oil and gas operations, and further could fluctuate based on that price in a manner that could be completely disassociated with activity and therefore local impacts.

Accordingly, the Study Group recommends that permittees for hydraulic fracturing be required to pay an impact fee that comports with the level of industrial activity for a given well, as opposed to the production from that well or the price of the commodity. In this way, the impact fee is tied more directly to costs created by what will be a new oil and gas industry in the state, as opposed to the value of the production, which can fluctuate. The fee would then go into a central fund managed at the state level, designated for local government impacts, and kept separate from the severance tax to fund state expenses. See Section XXX Severance Tax section below.

Counties and municipalities would access this source of revenue through an application process. Costs not eligible to be reimbursed in this process necessarily would be costs associated with transportation infrastructure damage, for which the Study Group recommends a separate bond and permit process in Section XX below. The application would require justification and documentation to demonstrate the costs for which the requested funds would be used to cover or recover and that these same costs would not exist otherwise. While the standard means of distribution of funds to a successful applicant would be by reimbursement, the Study Group recommends that an

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option for advancement of funds should be available if a local government can demonstrate need.

In order to arrive at a recommended impact fee level, the Study Group reviewed several optional proxies for local activity for oil and gas industrial activities. The Study Group arrived at the conclusion that impact is most determined by the number of fracturing stages in a given well because of the correlation between fracturing stages and local activity (the more stages per well, the more time the well takes to be fully operational, thus the more overall activity in a local area, including projected “truck trips”) The N.C. Geological Survey’s assessment of hydrocarbon operations in Ohio indicates that a typical gas well may have up to 30 individual hydraulic fracturing stages.

The Study Group recommends the implementation of a two-part impact fee. The first part of the fee is designed to recover the local costs that may rise simply by virtue of the fact that the well is being drilled, while the second part of the fee is designed to recover local costs that may vary with the number of stages of a given well. This fee would allow for cost recovery from both hydraulically fractured and non-hydraulically fractured wells and would be structured as follows:

- a. An initial flat fee of \$2,000 for each well pad; and
- b. A second fee of \$1,800 multiplied by the number of hydraulic fracturing stages per each well on a given pad; or
- c. A second fee of \$900 for the number of liquid-free fracturing stages per each well on a given pad. This reduced fee would encourage the use of liquid free technology for well stimulation and result in less infrastructure damage.

** Note that Pennsylvania’s “impact fee” is \$30,000 to \$50,000 per year. If we assess a flat fee of \$2,000 and an additional per-frack stage fee of \$1,800 we will be either within or near the high side of the PA example. NC’s severance tax will generate annual revenues for the State once a well is put into production.*

Monies collected from the impact fees could not only help to offset local costs, but also be used to help establish midstream and processing infrastructure development.

The Study Group also discussed the process by which a State entity could collect and disburse impact fee monies. The Study Group looked to the Department of Waste Management’s Underground Storage Tank (UST) Trust Fund system for a model approach. The DWM UST program manages a trust fund system, which was established under requirement of federal regulation, 40 CFR 20, to reimburse impacted entities for costs associated with spills or other unintentional releases from buried fuel

Comment [KM2]: Define- need a definition section.
Infrastructure which gathers and distributes product

Comment [JRL3]: We should probably discuss this – is the though that local governments could apply for what would essentially be economic development grants to provide infrastructure development to attract midstream operations? If so, we may want to spell that out in a bit more detail.

tanks and lines. The trust fund receives funding through tank registration fees (\$400 per tank), along with an allotment of 19/32 of each cent of fuel tax.

In a typical UST claim, a responsible party (tank owner or operator) pays an environmental consultant to perform investigation and environmental remediation activities. The responsible party then requests reimbursement for those respective costs from the UST Trust Fund office. Trust Fund personnel review the request, ensuring that environmental site work was performed in accordance with applicable State rules and DWM guidance. Once a reimbursement request is approved, notice of approval is sent to the State Controller's office, which processes the payment to the responsible party to cover payment owed to the environmental consultant.

The UST Section's trust fund office currently manages cost reimbursement for around 8,000 sites throughout North Carolina. The program is composed of one supervisor, three accounting technicians, one business officer, one processing assistant, two engineers, and seven hydrogeologists. The trust fund also receives legal support from the State's Attorney's General Office.

The Study Group recommends that a similar funding office be established within DEMLR to receive and distribute impact fee monies. Local governments would submit claims for cost impact reimbursement through this office to the Mining and Energy Commission. The "Energy Fund Office" would then disburse funds to local governments based on the MEC's approval of reimbursement requests. MEC approval would be dependent upon proper findings that the impacts are measurable, are tied to oil and gas activity, and that the costs are proven to be for work that was actually conducted. In the event that it is determined that local government applicants can seek advancement of funds rather than reimbursement, proper criteria would need to be established for review and approval of those applications. The Study Group recommends that the Energy Fund Office receive appropriated funding to support the following positions: one business officer, two processing assistant, and one attorney (part time). Funding these positions through budgetary appropriations would allow for 100 percent of impact fee monies to be distributed to local governments. Cost impact specifics for this office are shown in Table Y-6 and are included in the total cost to the State for overseeing oil and gas operations discussed in Section XX below.

C. Impacts to Local Transportation Infrastructure

To better predict the types of impacts that N.C. cities and towns may experience from development of the hydraulic fracturing industry in the state, the N.C. League of Municipalities (NCLM) surveyed towns in affected areas of drilling in Arkansas. Through conversations with those municipal officials, NCLM found that the major impacts to municipal operations occurred in the area of transportation infrastructure. Well construction and stimulation may include 1,000 to 1,200 truck trips, hauling water, propan (usually silica sand), and other materials. ing NCDOT's and DEMLR's estimate that each truck is equivalent to a road impact of 3,000 to 6,000 cars, which is exacerbated by traffic congestion or slow speed limits on streets. In North Carolina, impacts and damages to local government transportation infrastructure from hydraulic fracturing activities will be experienced heavily by municipalities.

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D. Local Permitting and Bonds To Recover Local Roads Impacts

To most adequately recover the costs of repairs to municipal transportation infrastructure, NCLM proposes, and the Study Group is recommending, a bond and permit system modeled after the one in Pennsylvania.

G.S. 160A-296 and 160A-300, provides N.C. municipalities the authority to exercise control over their municipally-controlled public streets by prohibiting, regulating, diverting, controlling, and limiting vehicular traffic. These statutes allow municipalities to establish weight restrictions and truck routes for municipal streets. With either approach, signs must be posted at the appropriate locations in order for the ordinance provisions to be effective and enforceable.

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This authority can similarly be used to support the local bond and permit system. Under the the proposal:

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1. A municipality in an area expecting hydraulic fracturing-related traffic by high weight vehicles would post weight limits for its roads. In order for a hydraulic fracturing company to operate over-weight vehicles on a posted municipal road, the municipality would issue an over-weight permit for the vehicle or vehicles.
2. To receive a permit, a company would enter into an Excess Maintenance Agreement (EMA) with the municipality, under which it would agree to pay for any maintenance or restoration of a posted road that it traveled that was in excess of normal maintenance. Such maintenance and restoration would not require improvements of the road beyond the state of repair at the time the permit took effect. The agreement would cover the roadway itself, as well as shoulders, curb and gutter, sidewalks, drainage facilities, and other

appurtenances.

3. The operator (hydraulic fracturing company) and the municipality would first make inspections to determine the condition of the roads covered by the EMA at the beginning and end of the EMA period. Interim inspections could also occur during the EMA period to identify damage that could be mitigated if addressed immediately, rather than at the end of the EMA period.
4. As part of the EMA, the hydraulic fracturing company would agree to either: (1) undertake all required maintenance and restoration itself, or (2) allow the municipality to undertake the maintenance and bill the company for the costs. In either case, the maintenance and restoration work would be inspected by both parties upon completion.
5. The hydraulic fracturing company would provide security, such as a performance bond or irrevocable letter of credit, to ensure that funds were available to cover the cost of any required maintenance and restoration. The amount of the bond would be tied to the level of use that the hydraulic fracturing company expected to make of the covered municipal roads. A hydraulic fracturing company's liability would not be limited to the level of security provided and the amount of security required could be increased by the municipality during the EMA period if interim inspections found that the expected cost of damage was greater than amount security.
6. If more than one hydraulic fracturing company sought a permit to operate on the same road(s), the companies would agree within a specified period of time on the percentage of maintenance and restoration cost that will be assigned to each company under its EMA. If the companies did not make the assignment within the specified time, the municipality would be authorized to make such assignment itself.
7. A company's failure to meet the EMA's terms would result in suspension or termination of the EMA *and haul permit would be revoked.*
8. A municipality would reserve the right to close a road covered by an EMA, or portion thereof, to any vehicle in excess of a specific weight if such closing was necessary for safety, or was a temporary closing due to weather conditions.
9. *A municipality may deny the right to the use of any roadway for public purpose, as long as they provide the industry an alternative, reasonable route.*

III. Energy Program Cost Impacts

The Division of Energy, Mineral, and Land Resources' (DEMLR) Energy Program is responsible for researching and drafting rules for the regulation of the oil and gas industry. Additionally, Program personnel will serve as DENR's regulatory entity to ensure that all operations are carried out in accordance with North Carolina statutes and rules.

A. Current Staffing and Support

The 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 1 and 2** for specifics.

B. 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.

C. 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.

D. 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.

E. 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 3** and **4** for more detailed information.

Table 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 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 3. Energy Program: Future Estimated Annual Costs.

Cost Impact	Amount per year	Notes
Salary and Support (13 Total Employees, which already includes the four current employees.)	\$908,432	<p><u>Central Office:</u> 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.</p> <p><u>Regional Office (WSRO?):</u> 1 Senior Specialist, 1 Environmental Specialist.</p> <p><u>Regional Office 2 (Fayetteville/Raleigh?):</u> 1 Senior Specialist, 1 Environmental Specialist.</p> <p>(*Note: assignment of RO personnel will depend on the location of future operations. Coastal Plain exploration may require additional specialists for the Washington RO.)</p>
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	

Table 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	

F. Additional Cost Impacts to DENR

Although the Energy Program is the lead entity for rule development and regulation, other non-Program personnel will be involved in oil or gas related activities. For instance, rule development decisions, as well as regulatory hearing decisions will ultimately be determined by the Mining and Energy Commission (MEC). The MEC is generally composed of 15 members who meet two days per month in Raleigh, N.C. Eligible commissioners receive per diem, as well as travel cost reimbursements. Additionally, MEC members may sometimes travel to other locations for training to assist them with the execution of their duties. The annual recurring cost to support the Commission is estimated to be \$70,350. Refer to **Table 5** for additional details.

Table Y-5. Mining and Energy Commission: Future Estimated Recurring Costs.

Cost Impact	Amount per year	Notes
Per Diem	\$11,250	Amount of \$15 per meeting day per commissioner. Allotted for 15 commissioners and about 50 meeting days per year.
Training & Seminars	\$4,500	Estimated based on a standard amount of \$300 per person per year. Includes registration fees for locally-sponsored training.
Travel	\$19,100	Based on current travel authorization estimates for MEC.
		Based on current meal authorization estimates for

Meals	\$14,500	MEC.
Lodging	\$14,500	Based on current lodging authorization estimates for MEC.
Miscellaneous Travel Expenses (parking fees, tolls, etc.)	\$6,500	Based on current estimates for MEC meetings, with an adjustment for fieldtrips/training.
Total	\$70,350	

Other employees within DENR who will have involvement with oil or gas operations include non-Energy Program members, who either oversee or work within other DENR entities. Examples include the Division of Water Quality (DWQ) and the Division of Waste Management (DWM), along with other DEMLR offices including Sediment and Erosion Control, Dam Safety, and the N.C. Geological Survey. DWQ and DWM are expected to provide minimal support to regulate oil and gas operations. Thus, these Divisions should only become involved whenever specific situations involving the industry are subject to their regulatory programs. Conversely, DEMLR personnel, who are not Energy Program members, will be routinely spending portions of staff time dealing with oil or gas matters. As a result, these employees will need to receive specialized training, along with travel authorizations to carry out their duties. Overall costs to DENR for non-Energy Program personnel are estimated at around ~~\$310,000~~. Table 6 provides specific details. Information regarding the “Energy Funding Office” is provided under the “Local Government Cost” section of this report.

Table 6. Non-Energy Program DENR Entities: Future Estimated Recurring Costs.

Cost Impact	Amount per year	Notes
DEMLR (General Non-Energy Program employees): Salary & Support	\$193,000	Employees include: DEMLR Division Director (35% time), Land Quality Section Chief (30 % time), Chief Engineer (25% time), Erosion Control Specialist (5% time), Dam Safety Specialist (5% time), Storm Water Engineer (5% time), State Geologist (25% time), and NC Geol. Survey Geologist (75% time).
DEMLR (General Non-Energy Program employees): Office Space (Operating)	\$2,720	Includes copier use, internet access, phone use, etc. Amount based on average percentage of time spent by non-Energy Program personnel. Estimated amount is \$340.00 per person.

DEMLR(General Non-Energy Program employees): Personal Protective Equipment (Standard)	\$4,000	Estimated from standard amount of \$500 per person.
DEMLR (General Non-Energy Program employees): Professional Training	\$1,040	Estimated based on average percentage of time spent by non-Energy Program personnel. Estimated amount is \$130 per person. Includes registration fees for locally-sponsored training.
DEMLR (General Non-Energy Program employees): Vehicle Use (Rented)	\$3,000	Rental cost for one vehicle, based on minimal mileage use (1,050 miles/month) and the average percentage of time spent by non-Energy Program personnel.
DEMLR (General Non-Energy Program employees): Travel	\$5,000	Allows for 1,300 miles at \$0.48/mi for each employee. Thus, 10,400 miles.
DEMLR (General Non-Energy Program employees): Meals	\$1,200	\$36.35/dy for 4 days/yr per operational employee. Thus, 32 days total. Estimated at \$1,200 total.
DEMLR (General Non-Energy Program employees): Lodging	\$2,100	\$65.90/dy for 4 days per employee. Thus, 32 days total. Estimated at \$2,100 total.
DEMLR (Non-Energy Program employees, "Energy Fund Office"): Salary & Support	\$180,841	One business officer (100%), two processing assistants (100%), and one attorney (25%).
DEMLR (Non-Energy Program employees, "Energy Fund Office"): Office Space (Operating)	\$3,900	Includes copier use, internet access, phone use, etc. Amount based on Archdale rate of \$1,300 per person, excluding the attorney position.
DWM: Salary & Support	\$17,000	Employees Include: Two Regional Supervisors (5% time) and Two Regional Hydrogeologists (5% time).
DWQ: Salary & Support	\$17,000	Employees Include: Two Regional Supervisors (5% time) and Two Regional Hydrogeologists (5% time).
DENR (Main Office): Salary & Support	\$64,000	Policy Analyst (80% time).
Total	\$492,701	

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IV. NCDOT- State Costs

A. CURRENT STAFFING AND SUPPORT

The North Carolina Department of Transportation, Division of Highways, is made up of 14 Divisions statewide. Each Division has a similar staffing structure comprised of a Division Engineer, Division Maintenance Engineer, Division Construction Engineer, Division Operations Engineer and Bridge Engineers. Each Division is further divided into Districts. Most Districts are comprised of multiple counties. Each District has a District Engineer, Assistant District Engineer, County Maintenance Engineers, Engineering Technicians and Road Maintenance Supervisors. Multiple Clerical Support positions are located in the Division and Districts. Permitting of Access to state roads and work within NCDOT rights of way are already primary responsibilities of District Engineers. Residential, Commercial and Industrial development drives the volume of permits received and processed. The Division also has Engineering Technicians that are assigned to Resident Engineers. These Technicians inspect construction projects and are involved in contract administration. The District Engineer has the ability to utilize the construction technicians for permitting depending upon the needs.

NCDOT technical support units will also be heavily involved in the permitting and compliance aspects of the energy industry. The Structures Management Unit and Pavement Management Unit will assist Division and District personnel with condition and weight capability analysis and suggested methods of repair.

Current funding for the above positions comes from Highway Maintenance Allocations as well as the Transportation Improvement Program. Highway Maintenance Allocations also pay for equipment, materials and contract work associated with the maintenance of roads and bridges. The Transportation Improvement Program (TIP) is a blend of federal and state monies that pay for our larger construction projects and bridge replacements.

B. FUTURE STAFFING AND SUPPORT

As with DENR, NCDOT future staffing needs are also difficult to determine depending upon the volume of energy development and future workload of the individual offices. 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 workload associated with the energy industry would be handled by current staff with additional consultant staff hired as needed. NCDOT is recommending a new position to serve as the Director of Energy operations. This position would serve as the coordinator for energy operations statewide and would assure uniformity and consistency in our permitting and compliance process. See Table Y-5 for staffing permitting costs due to the energy industry and Table Y-6 for staffing compliance costs.

C. Equipment Needs

NCDOT Equipment needs include vehicles used for traveling to and from meetings, site investigations and other local travel needs. Other needs include Personal Protective Equipment such as steel toe boots, hardhats, safety vests and safety glasses. Electronic equipment including GPS receivers, digital cameras and laptops will be essential to effectively manage the workload associated with the Energy industry.

Table Y-5. Permitting Costs (annual costs)

Staff Costs				
Positions	Hrs/ Permit	Total Hrs (40 Permits /Year)	Rate /Hr ***	Total Costs
Energy Coordinator (New)	4	160	\$97.36	\$15,577.60
District Engineers	10	400	\$91.95	\$36,780.00
County Maintenance Engineers	6	240	\$76.89	\$18,453.60
Road Maintenance Supervisors	6	240	\$61.66	\$14,798.40
Assistant District Engineers	16	640	\$54.09	\$34,617.60
Engineering Technicians	30	1,200	\$45.43	\$54,516.00
Bridge Engineering	12	480	\$81.13	\$38,942.40
Pavement Engineering	4	160	\$81.13	\$12,980.80
Clerical Support	3	120	\$32.45	\$3,894.00
	TOTAL STAFF:			\$230,560.40
				=\$5,764.01/permit

Equipment Support				
Item	/Permit	Total		
Vehicles (Mileage @.565/mile)	600 mi.	24,000 mi.		\$13,560
	TOTAL:			\$244,120.40
				=\$6,103.01/permit

*The hours associated with the positions above will be using primarily existing staff and supplemented with consultants as needed.

**Monies associated with the above positions come from charging directly to construction projects or maintenance functions. Energy funding would be needed to accommodate the dollars needed for the hours and costs denoted above.

***Rates determined using a 2.25 salary multiplier which is a typical overhead and profit multiplier used when hiring consultants.

Table Y-6. Compliance Costs (annual costs, based on a rate of 40 permits approved per year)

Positions	Total Hrs	Rate /Hr ***	Total Costs
Energy Coordinator (New)	1,920	\$97.36	\$186,931.20
District Engineers	208	\$91.95	\$19,125.60
County Maintenance Engineers	312	\$76.89	\$23,989.68
Road Maintenance Supervisors	624	\$61.66	\$38,475.84
Assistant District Engineers	2,080	\$54.09	\$112,507.20
Engineering Technicians	3,120	\$45.43	\$141,741.60
Bridge Engineering	624	\$81.13	\$50,625.12
Pavement Engineering	312	\$81.13	\$25,312.56

Clerical Support	416	\$32.45	\$13,499.20
	TOTAL STAFF:		\$612,208.00
Equipment Support			
Item			
Vehicles (Mileage @.565/mile)	100,000 mi.		\$56,500
Personal Protective Equipment			\$2,000
GPS/Cameras (7each)			\$1,400
Laptops (7each)			\$2,100
	TOTAL:		\$674,208

*The hours associated with the positions above will be using primarily existing staff and supplemented with consultants as needed.

**Monies associated with the above positions come from charging directly to construction projects or maintenance functions. Energy funding would be needed to accommodate the dollars needed for the hours and costs denoted above.

***Rates determined using a 2.25 salary multiplier which is a typical overhead and profit multiplier used when hiring consultants.

V. Potential Revenue Sources

A number of possible revenues sources to cover the costs of operating a modern oil and natural gas program were studied by the Study Group. These sources include severance taxes, impact fee, assessment of property taxes, and the well permitting and abandonment fees. Initially the Group had listed a possible fee for site inspections, but this was later removed due to no other Division within the Department charging a fee for site inspections. Within the DEMLR sections, routine inspections are performed by staff as either a component of their job responsibilities or the main component of their job responsibilities.

A. Permitting and Application Review Fees

The majority of oil and gas producing states have some amount of fee that is required for the permitting of wells. Under existing statute (cite), there is a fee per permit application of \$3,000. It is expected that this fee will cover some of the costs of administering the program at DENR, but not be sufficient to recover all of the increased costs to the state set out in the above tables.

Comment [JRL8]: Do we want to recommend an increase to this fee here? If so, what are the fees from other states?

B. Property Taxation

The Funding Levels and Potential Funding Sources Study Group recognizes and respects the ability of local governments to assess and collect property taxes on both real estate and severed mineral rights. Exercising such authority provides an additional mechanism for local governments to recover costs associated with oil and gas operations. In accordance with the MEC's Local Government Regulation Study Group, the Funding Levels and Potential Funding Sources Study Group recommends that local authorities consider the following strategies related to cost recovery:

- a. Use of ad valorem taxation;
- b. Implementing a standard approach for the taxation of severed mineral rights;
- c. Taxing of mineral rights only when resources are exploited;
- d. Taxing of oil and gas operational equipment being stored on-site;
- e. Taxing of joint surface and mineral rights at the time of property sale; and
- f. Local governments implementing a special use permitting program should be aware of the potential for land-owner abuse of a "present value" designation to avoid taxation on the production of subsurface resources.

The Funding Levels and Potential Funding Sources Study Group also encourages local governments to exercise their authority related to the taxing of personal (business) property owned or used by oil and gas operators. DEMLR staff compiled the following details regarding this form of taxation within several Triassic Basin Counties:

- a. Taxing of personal property by local governments is in accordance with the North Carolina Machinery Act.

- b. All business property, except vehicles tagged in other states, is subject to taxation. Thus, drilling rigs, storage tanks, well equipment, etc. are all taxable assets.
- c. Personal business property that exists within a county on January 01 of a given year is subject to taxation, for that entire year.
- d. No time limits or time requirements exist regarding taxation eligibility.
- e. Any business must provide the respective county with a list of its personal property.
- f. Tax rates are assessed per every \$100 value of personal property.
- g. Personal business property is also subject to taxing from towns, cities, and fire districts. These taxes are supplemental to those already levied by counties.
- h. Tax rate amounts vary for the following Triassic Basin counties:
 - i. Rockingham County: \$0.6960 per every \$100.
 - ii. Stokes County: \$0.6400 per every \$100, plus and education tax of \$0.04 per every \$100.
 - iii. Chatham County: \$0.6219 per every \$100.
 - iv. Lee County: \$0.7200 per every \$100.
 - v. Fire Districts and Towns: Range from \$0.07 to \$0.40 per every \$100.
- i. Personal property tax bills are generally sent in September and are delinquent in January of the following year.
- j. The likelihood of an oil or gas operator moving from one county into another to take advantage of a lower tax rate is low, due to operational and logistical complexities associated with demobilization of equipment.

C. Severance Tax

Various states impose a severance tax on oil and gas wells which are in production. Tax structure is generally based on the volume of product produced, the market value of product produced, or a combination of both. Examples of severance taxing strategies from selected states are presented in Table YY.

The North Carolina General Assembly is planning to draft legislation to establish severance tax rates. Nevertheless, the Study Group asks the legislature to consider these recommendations regarding severance taxing:

- a. Any severance tax should be based on the market value, not the volume of product being produced;
- b. The severance tax should be adequate enough to properly fund NCDOT and NCDENR work related to the oil and gas industry;
- c. North Carolina should have a simple severance tax structure; and
- d. North Carolina should structure its severance tax so that industry is not discouraged from operating.

Table Y-Y. Summary of Severance Tax Examples. Data within this table were excerpted from the article, "State Revenues and the Natural Gas Boom" (Cassarrah Brown, 2013), which is

available at <http://www.ncsl.org/issues-research/energyhome/state-revenues-and-the-natural-gas-boom.aspx>.

State	Type of Tax	Tax Strategy	Revenue Distribution
Arkansas	Natural Gas Severance tax	Tax on market value of gas produced: 1.5% for new discovery gas 1.5% for high-cost gas 1.25% for marginal gas 5% on natural gas not defined as new discovery or marginal gas 5% on high-cost gas	5% of revenues deposited into state general fund 95% of revenues deposited as special revenues distributed via Highway Distribution Law
	Oil Excise Tax	Tax on market value at time of severance: 4% of the market value when production averages 10 barrels or less per well per day 5% of the market value when production averages more than 10 barrels per well per day	3% of revenues deposited into General Revenue Fund Account Of remaining 97%: 75% to State Treasury 25% to County Aid Fund
Colorado	Gas and oil tax	Levied on the gross income from crude oil, natural gas, and oil and gas.	Deposited in the state general fund and distributed among various state and local government funds.
Nevada	Oil and Gas Fee	Up to \$0.20 per 50,000 cubic feet of natural gas or barrel of oil	Revenues credited to the Oil and Gas Conservation Fund
N. Dakota	Oil and Gas Gross Production Tax	\$0.1143 per MCF of gas 5% of gross value of gas or oil	30% of revenues deposited in the state Legacy Fund Remainder distributed, via formula, to Oil and Gas Impact Fund and political subdivisions within state, including state

State	Type of Tax	Tax Strategy	Revenue Distribution
			general fund
Ohio	Severance Tax	\$0.025 per MCF of natural gas \$0.10 per barrel of oil	10% of revenue deposited in the Geological Mapping Fund 90% of revenue deposited in the Gas Well Fund
Pennsylvania	Gas Well Fee	Fee on oil or gas well. Fee changes annually with price of natural gas.	Monies distributed among the Unconventional Gas Well Fund, the Marcellus Legacy Fund, counties, and municipalities.
Texas	Gas and Oil Production Tax	7.5% tax of gas market value 4.6% tax of oil market value 4.6% tax of gas condensate market value for gas condensate	0.5% of revenues used for enforcement of production tax and tax provisions Remaining revenues: 25% deposited in the Foundation School Fund 75% deposited in the General Revenue Fund

The Study Group assessed the likely level of activity in the state from oil and gas production activities and determined that based on a simple projection of activity, a severance tax of XXX on the market value of the product would be required to recover the costs to the state, as set out above, of running the program. **NEED TO FILL IN THIS SECTION.**

D. Well Abandonment Fee

North Carolina General Statute 113-395 has already established the abandonment fee for an oil or gas well as being \$450. The Study Group agrees with this current legislation and understands that setting this fee too high will discourage industry from properly abandoning wells.

E. Recommended 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.

1. 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.

2. 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**. Currently in North Carolina, under 15NCAC 05C.0100, the state does regulate all geophysical exploration that will use dynamite or other explosives to produce and collect subsurface geophysical data. These types of investigations require that a permit be filed with the Geological Survey. There is currently no permit fee or bond required to conduct this type of explosion investigations in North Carolina.

The recommendation of the Study Group is that a blanket bond of \$50,000 be provided by any person or company seeking to perform geophysical exploration involving explosive charges or other similar techniques 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.

3. 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 wellbore that will be filled with cement in accordance with North Carolina well abandonment rules.

4. 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.

F. Types of Allowed Bonds

The recommendation of the Study Group is to accept the same types of bonds, or assurances, that the Mining Program currently 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 plugging 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 oil and gas 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.

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.

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 Number of Units	1500 1	MI	9.79	14,685.00	8,811.00
2	MILEAGE FOR CEMENTING CREW.ZI Number of Units	1500 1	MI	5.76	8,640.00	5,184.00
16094	PLUG BACK/SPOT CEMENT OR MUD.ZI DEPTH FEET/METERS (FT/M)	1 2550 FT	EA	6,626.00	6,626.00	3,975.60
114	R/A DEN'SOMETER W/CHART RECORDER./JOB.ZI NUMBER OF UNITS	1 1	JOB	1,285.00	1,285.00	771.00
119534	SUCTION HOSE, 4"/FT W/HES.PER JOB.ZI NUMBER OF JOBS	200 1	FT	4.40	880.00	528.00
14089	PUP TRAILER, NON-ACID MATLS, 0-8 HRS.ZI HOURS (MINS)	1 8	EA	822.00	822.00	493.20
100003687	PREMIUM CEMENT	400	SK	53.28	21,312.00	12,787.20
3965	HANDLER&DUMP SVC' CHR'G. CMT&ADDITIVES.ZI NUMBER OF EACH Unit of Measurement	400 1	CF	5.49	2,196.00	1,317.60
76400	ZI MILEAGE, CMT MTL'S DEL/RET MDN NUMBER OF TONS	750 18.8	MI	3.35	47,235.00	28,341.00
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 Number of Units	1500 1	MI	0.72	1,080.00	1,080.00
86954	ZI FUEL SURCHG-CARS/PICKUPS-1 1/2TON Number of Units	1500 1	MI	0.24	360.00	360.00
87605	ZI FUEL SURCHG-CMT & CMT ADDITIVES NUMBER OF TONS	750 18.8	MI	0.24	3,384.00	3,384.00
	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 HOURS UNIT OF MEASURE - HRS	1 1 H	EA	1,139.00	1,139.00	797.30
464256	CMT, Bulk Truck on loc, additional hours HOURS UNIT OF MEASURE - HRS	1 1 H	EA	196.00	196.00	137.20
10	FOOD AND LODGING, ZI NUMBER OF PERSONNEL ON JOB	3 3	DAY	653.00	5,877.00	4,113.90

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	<p><i>Amount per well:</i> 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)</p> <p><i>Blanket bond:</i> Not less than \$200,000.</p>	Ensures proper construction, operation, maintenance, and abandonment; and that each location is cleared according to State rules.	Surety or a personal bond
Arizona	<p><i>Amount per well:</i> \$10,000 for well depth to 10,000 ft; \$20,000 for well depth > 10,000 ft.</p> <p><i>Blanket bond:</i> \$25,000 for 10 or fewer wells; \$50,000 for between 10 - 50 wells; or \$250,000 for 50+ wells.</p>	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	<p><i>Blanket bond:</i> \$25,000 for 1 to 25 wells; \$50,000 for 60 to 100 wells; \$100,000 for more than 100 wells.</p>	Plugging, well repair, and well site restoration.	Surety bond, irrevocable letter or credit, CD, cash.
California	<p><i>Amount per well:</i> \$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.</p> <p><i>Blanket bond:</i> (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.</p> <p><i>Idle well fee or bond:</i> \$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.</p>	<p>Well construction, repair, re-drilling, plugging, and site restoration</p> <p>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.</p>	Cash or indemnity bond.

	Cost of Bond	What is Being Bonded?	Type of Surety Allowed
Florida	<i>Amount per well:</i> \$50,000 for 0 to 9,000 ft; \$100, 000 if 9,000 ft or greater. Amounts are doubled if well is successful. <i>Blanket bond:</i> \$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	<i>Amount per well:</i> Flexible, up to \$50,000 <i>Blanket bond:</i> \$50,000 and adequate documentation of financial resources to plug wells.	Well plugging according to specifications.	Not specified
Idaho	<i>Amount per well:</i> \$10,000 plus \$1.00 per ft. <i>Blanket bond:</i> \$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	<i>Amount per well:</i> \$1,500 (less than 2,000 ft); \$3,000 (over 2,000 ft). <i>Blanket bond:</i> \$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	<i>Amount per well:</i> \$2,500 <i>Blanket bond:</i> \$45,000	Plugging and abandonment of wells, restoration.	Surety bond, certificate of deposit, cash.
Kansas	<i>Amount per well:</i> \$0.75 times the aggregate depth for all wells drilled or operated. <i>Blanket bond:</i> 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.

	Cost of Bond	What is Being Bonded?	Type of Surety Allowed
Kentucky	<p><i>Amount per well:</i> \$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).</p> <p><i>Blanket bond</i> (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).</p> <p><i>Blanket bond</i> (for “unqualified” operators): \$50,000 (1 to 100 wells); \$100,000 (over 100 wells).</p>	Compliance purposes – plugging.	Cash, letter of credit, surety, and certificates of deposit
Louisiana	<p><i>Amount per well</i> (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).</p> <p><i>Amount per well</i> (inland water): \$8.00 per ft.</p> <p><i>Amount per well</i> (water): \$12.00 per ft.</p> <p><i>Blanket bond</i> (land): \$25,000 (0 to 10 wells); \$125,000 (11 to 99 wells); \$250,000 (over 100 wells).</p> <p><i>Blanket bond</i> (inland water): \$125,000 (0 to 10 wells); \$625,000 (11 to 99 wells); \$1,250,000 (over 100 wells).</p> <p><i>Blanket bond</i> (water): \$250,000 (0 to 10 wells); \$1,250,000 (11 to 99 wells); \$2,500,000 (over 100 wells).</p>	Plugging and restoration.	Certificate of deposit, performance bond, letter of credit.
Maryland	<p><i>Amount per well:</i> no minimum, \$100,000 maximum.</p> <p><i>Blanket bond:</i> no minimum, \$500,000 maximum.</p>	Plugging and site restoration.	Surety bonds, cash, letters of credit, certificates of deposit.

	Cost of Bond	What is Being Bonded?	Type of Surety Allowed
Michigan	<p><i>Amount per well:</i> dependent on well depth, ranges from \$10,000 to \$30,000.</p> <p><i>Blanket bond:</i> dependent on well depth, ranges from \$100,000 to \$250,000.</p>	Well plugging and site restoration.	Conformance bond, letter of credit, cash, certificate of deposit.
Missouri	<p><i>Amount per well:</i> \$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).</p> <p><i>Blanket bond:</i> \$20,000 (0 to 800 ft) for 50 wells; \$30,000 (801 to 1,200 ft) for 15 wells.</p>	Plugging, abandonment, and site restoration.	Surety bond, personal bond, letter of credit.
Nebraska	<p><i>Amount per well:</i> Currently \$5,000 but will increase to \$10,000</p> <p><i>Blanket bond:</i> Currently \$25,000 but will increase to \$100,000.</p>	Plugging, abandonment, and site restoration.	Insurance or certificate of deposit.
Nevada	<p><i>Amount per well:</i> \$10,000.</p> <p><i>Blanket bond:</i> \$50,000.</p>	Plugging and abandonment	Corporate surety licensed to do business in Nevada.
New Mexico	<p><i>Amount per well:</i> \$5,000 + \$1.00 per ft in major producing counties; \$10,000 + \$1.00 per ft for wells located elsewhere.</p> <p><i>Blanket bond:</i> \$50,000, but single well bond may be required in addition to the blanket bond for wells inactive for more than 2 years.</p>	Plugging, abandonment, restoration, and remediation.	Surety shall be a reputable corporate surety authorized to do business in New Mexico.

	Cost of Bond	What is Being Bonded?	Type of Surety Allowed
North Dakota	<p><i>Amount per well:</i> \$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.</p> <p><i>Blanket bond:</i> \$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.</p>	Drilling, plugging, and restoration.	Collateral bond, self-bond, cash, or any alternative form of security approved by the commission.
Oklahoma	<p><i>Amount per well:</i> 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.</p> <p>Blanket bond: \$25,000 (Category B); \$50,000 (Category A).</p>	Drilling, operation, plugging, and restoration.	<p><i>Category A:</i> Financial statement showing net worth of \$50,000 or greater.</p> <p><i>Category B:</i> Corporate surety bond, irrevocable commercial letter of credit, bank joint custody receipt, certificate of deposit, cashier's check, cash, or other negotiable instrument.</p>
Oregon	<p><i>Amount per well:</i> \$10,000 (less than 2,000 ft); \$15,000 (2,000 ft to 5,000 ft); \$25,000 (deeper than 5,000 ft).</p> <p><i>Blanket bond:</i> \$100,000 minimum and must equal the individual well bond amounts.</p> <p><i>Seismic bond:</i> \$50,000, but may be waived if a blanket bond is in place.</p>	Compliance with rules and regulations of the State of Oregon.	Not specified

	Cost of Bond	What is Being Bonded?	Type of Surety Allowed
Pennsylvania	<p><i>Amount per well (conventional wells):</i> \$2,500 per well.</p> <p><i>Blanket bond (conventional wells):</i> \$25,000 for all wells.</p> <p><i>Unconventional wells bond (wells with total bore length less than 6,000 ft):</i> 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;</p> <p><i>Unconventional wells bond (wells with total well bore length of 6,000 ft or greater):</i> 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.</p>	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	<p><i>Amount per well:</i> \$5,000 for plugging and performance; \$2,000 for surface restoration.</p> <p><i>Blanket bond:</i> \$20,000 for plugging and performance; \$10,000 for surface restoration.</p>	Proper plugging and surface restoration.	Corporate surety bond, certificate of deposit, letter of credit.

	Cost of Bond	What is Being Bonded?	Type of Surety Allowed
Tennessee	<p><i>Amount per well:</i> \$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.</p> <p><i>Blanket bond:</i> \$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.</p>	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	<p><i>Amount per well:</i> \$2.00 per foot for each well, excluding wells covered by plugging insurance.</p> <p><i>Blanket bond:</i> 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.</p> <p><i>Additional bond (Operators of bay/near shore wells):</i> \$60,000, in addition to the other required bonds (above).</p> <p><i>Additional bond (offshore wells or combination of bay and offshore wells):</i> \$100,000, in addition to the other required bonds (above).</p> <p><i>Note:</i> Reductions of "additional bonds" may be allowed by the State, if the operator can prove other means of financial assurance.</p>	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.
Virginia	<p><i>Amount per well:</i> An amount sufficient for plugging and site restoration not less than \$10,000 per well plus \$2,000 per acre of disturbed land.</p> <p><i>Blanket bond:</i> \$25,000 (1 to 15 wells); \$50,000 (16 to 30 wells); \$75,000 (31 to 50 wells); \$100,000 (51 or more wells).</p>	Plugging and restoration	Certificate of deposit, cash, other surety bonds acceptable by the State.
Washington	<p><i>Amount per well:</i> Not less than \$50,000</p> <p><i>Blanket bond:</i> Not less than \$250,000</p>	Proper well abandonment and site reclamation.	Not specified

	Cost of Bond	What is Being Bonded?	Type of Surety Allowed
West Virginia	<p><i>Amount per well:</i> \$5,000 per vertical well; \$50,000 per horizontal well.</p> <p><i>Blanket bond:</i> \$50,000 for multiple vertical wells; \$250,000 for multiple horizontal wells.</p>	Plugging and site reclamation	Not specified
Wyoming	<p><i>Amount per well:</i> \$10,000 for each well less than to equal to 2,000 ft; \$20,000 for each well deeper than 2,000 ft.</p> <p><i>Blanket bond:</i> \$75,000</p> <p><i>Idle well bond:</i> \$10.00 per ft.</p>	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.

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

State	Rule	Requirement	Forms	Fees & Bonding
Colorado	Rule 333 (seismic operations)	<p>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.</p> <p>1. Shot holes have been properly plugged and abandoned and source/receiver lines have been reclaimed.</p> <p>2. No outstanding complaints received from surface owners.</p>	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	<p>Application fee for seismic operations is \$500.</p> <p>Bond will be a minimum of \$50,000 but not more than \$250,000.</p> <p>Financial assurance shall remain in effect for one year following the conclusion of all field seismic operations.</p>
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	Form 1006SB: Surety Bond for Seismic Shot Hole Plugging within	\$50,000 bond

State	Rule	Requirement	Forms	Fees & Bonding
		posted.	the State of Oklahoma	
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. Department of the Interior – Bureau of Land Management (BLM) & U.S. Department of Agriculture – Forest Service (FS)	Code of Federal 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.	BLM managed lands – party filing NOI will need a bond and geophysical operator will need a bond. FS managed lands – authorized officer decides whether bond is required.	BLM Form 3150-4/FS 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	No amount provided

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

DETERMINATION OF RECLAMATION COST AND BOND					
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
Access Road Construction	Cubic Yards				
Aggregate Base	630				
Course Aggregate	945				
Subtotal Access Road	1575				
			Reclamation cost per acre		\$41,230.16
Well Pad Construction			Reclamation cost per acre leaving		\$27,708.42
Aggregate Base	1860				
Course Aggregate	2785				
Subtotal Well Pad	4645				
Total Aggregate	6220				
			Total Land Distrubance	9.2 Acres	
			Access Road	1.14 Acres	
			Well Pad	3.45 Acres	

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.	<p><u>Advantages:</u> (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.</p> <p><u>Disadvantages:</u> (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.</p>
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.	<p><u>Advantages:</u> (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.</p> <p><u>Disadvantages:</u> (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.</p>
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.	<p><u>Advantages:</u> (1) Bank guaranty that the bond will be covered. (2) Paperwork is easier to process, compared to other instruments.</p> <p><u>Disadvantage:</u> DENR must move quickly to obtain funds if the operator goes bankrupt. Otherwise, other creditors might obtain money first.</p>

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.)	<p><u>Advantage:</u> The money is "in-hand" and easily accessed by DENR.</p> <p><u>Disadvantages:</u> (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).</p>
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