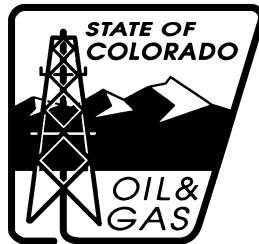


**FY 2007-2008 REPORT TO THE
WATER QUALITY CONTROL COMMISSION
and
WATER QUALITY CONTROL DIVISION
of
THE COLORADO DEPARTMENT OF
PUBLIC HEALTH AND ENVIRONMENT**

**by
THE COLORADO OIL AND GAS CONSERVATION COMMISSION**



**of
THE DEPARTMENT OF NATURAL RESOURCES**

**IN ACCORDANCE
WITH**

**THE AUGUST 28, 1990 MEMORANDUM OF AGREEMENT
and
THE IMPLEMENTING PROVISIONS OF SENATE BILL 181**

NOVEMBER 2008

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1. INTRODUCTION

The Colorado Oil and Gas Conservation Commission (COGCC) is an implementing agency for water quality standards and classifications adopted by the Water Quality Control Commission (WQCC) for ground water protection. This authority was provided by SB 89-181, and is restated and clarified by a Memorandum of Agreement (MOA) that was adopted by the agencies on August 8, 1990.

Section 5.1 of the MOA specifies that the COGCC must report annually to the WQCC about how its programs assure compliance with WQCC water quality standards and classifications for the activities, which are subject to the jurisdiction of the COGCC.

This seventeenth annual report includes a summary of COGCC activities and changes in ground water protection programs that were made during the preceding year. Major issues concerning the implementation of water quality standards and classifications are also reported.

2. COGCC ORGANIZATION AND FUNCTIONS

Public Outreach and Communication

The COGCC employs the following strategies for effective communication with the public and the regulated industry:

- Ten staff reports are prepared for submittal to the COGCC Commissioners. Ongoing staff activities such as compliance and enforcement actions, environmental and landowner issues, and other topics relevant to the mission of the COGCC are summarized in these reports. They are distributed widely to interested parties and they are posted on the COGCC website www.cogcc.state.co.us.
- A toll free telephone number (888-235-1101) to the Denver office has been established as a complaint hotline for citizen use.

The Commission is committed to attempting to hold at least three of its 10 hearings outside Denver each year. We continue to be successful in securing funding for these trips as part of our annual budget. In FY 2007-2008 the COGCC held three (3) of its ten (10) hearings outside of Denver: one (1) in Longmont and two (2) in Grand Junction.

- The COGCC continues to solicit participation on all levels from stakeholders - those representing the oil and gas industry, local government, citizens, other agencies, agriculture, and the environmental community.
- The COGCC continues to expand our internet presence. In addition to accessing oil and gas well data, internet users are able to access information regarding pits, spills/releases, complaints, and remediation projects and reports from numerous baseline ground water quality studies and environmental monitoring and investigation projects. The queries by which users access these data continue to be modified and refined to make them more "friendly". Please visit our website at www.cogcc.state.co.us.

COGCC Commissioners

The Colorado Oil and Gas Conservation Act, as amended by HB 07-1341, requires that the Commission consist of nine (9) Commission members. HB 07-1341 also includes the following requirements for the members: seven (7) members appointed by the governor with the

consent of the senate and two (2) ex officio voting members who are the Executive Directors of the Department of Natural Resources and the Department of Public Health and the Environment. At least two (2) members are appointed from west of the continental divide and the other members are appointed taking into account the need for geographical representation of other areas of the state with high levels of oil and gas activity or employment. Of the seven, three (3) members are to have substantial experience in the oil and gas industry and at least two (2) of these must have college degrees in petroleum geology or petroleum engineering; one (1) member must be a local government official; one (1) member must have formal training or substantial experience in environmental or wildlife protection; one (1) member must have formal training or substantial experience in soil conservation or reclamation; and one (1) member must be actively engaged in agricultural production and also be a royalty owner. Biographical sketches of the COGCC Commissioners are included in Appendix 1.

COGCC Staff

The COGCC has fifty six (56) employees as shown on the organization chart included in Appendix 2. COGCC staff now includes eight (8) engineers/engineers-in-training, nine (9) field inspectors, one (1) engineering/environmental technician in the Engineering Unit, and nine (9) environmental protection specialists (EPS) in the Environmental Unit. Three (3) of the engineers/engineers-in-training and the nine (9) field inspectors are located in offices in Battlement Mesa, Broomfield, Cheyenne Wells, Durango, Greeley, Parachute, Rifle, Sterling, and Trinidad, which helps to maximize their time for field inspections and response to complaints and incidents. Four (4) of the environmental protection specialists (EPS II) are located in offices in Brighton, Durango, Rifle, and Trinidad, which helps to maximize their complaint response time and ability to identify and address other potential environmental issues related to oil and gas development. The map included in Appendix 3 shows the geographical areas of responsibility assigned to the engineer/inspector and the environmental staff.

COGCC Environmental Unit

The COGCC environmental staff is comprised of six (6) EPS IIs, two (2) Environmental Supervisors, and one (1) Environmental Manager, all of whom have professional experience and expertise in environmental issues associated with oil and gas operations, hydrogeology and geology. We continue to handle questions, concerns, problems, programs, and issues relating to the oil and gas industry's impact on the environment, and public health safety and welfare. In addition, one (1) of the EPS II implements the COGCC's Onsite Inspection Policy, which is discussed in more detail in Part G. The environmental staff works closely with the COGCC engineering staff and in particular with the field inspectors. Incidents resulting in environmental impacts are typically referred to the environmental staff for investigation and enforcement. The primary responsibilities of the environmental staff are discussed below:

A. Spill/Release Response: Operators are obligated to report spills and releases that occur as a result of oil and gas operations, in accordance with COGCC Rule 906. Produced oil, gas, and water are the substances most commonly spilled or released. These substances fall under the exploration and production (E&P) waste exemption to regulation as hazardous wastes under Subtitle C of the Resource Conservation and Recovery Act (RCRA); therefore, they are subject to COGCC jurisdiction. Generally, impacts from these events are limited to soils and are relatively small in areal extent.

Spill response by the environmental staff includes onsite inspections, sample collection, remediation oversight, review of reports and remediation plans, as well as operating practices, to ensure protection of surface and ground water, in accordance with COGCC rules and WQCC standards and classifications. Spills are tracked in COGCC's master relational database (MRDB) and can be accessed via the COGCC website. In FY 2007-2008 approximately 380 spills and

releases were reported and remediated or are in the process of being remediated.

B. Complaint Response: The COGCC responds diligently to complaints, which are received from individuals and other agencies. Complaints are tracked in the COGCC's MRDB database and can be accessed via the COGCC website. In FY 2007-2008 approximately 296 complaints were filed and responded to, and approximately 97 complaints were resolved. Often complaints are from landowners, alleging damage to their land or water wells. The environmental staff follows up where appropriate, taking samples when necessary. Operators are required to perform additional investigation and remediation, as needed, to bring sites into compliance with soil and ground water standards.

C. Remediation Projects: Operators are required to remediate significant adverse environmental impacts that occur as a result of oil and gas activities. Situations requiring remediation often result from spills and releases of produced water and hydrocarbons discovered at the time of occurrence, during due diligence investigations, during the plugging of wells and abandonment of locations, and during pit closures. The environmental staff manages remediation projects by reviewing and approving plans, evaluating analytical data and the progress of the remediation work, and by establishing cleanup standards, points of compliance, and other requirements for operators to meet. Remediation projects are tracked in the COGCC's MRDB database and can be accessed on the COGCC website. During FY 2007-2008, approximately 38 operators submitted approximately 270 new remediation plans for approval and approximately 132 remediation projects were closed. The environmental staff managed a total of approximately 768 remediation projects during FY 2007-2008.

Where ground water has been impacted, operators are required to: mitigate any continued release; investigate the extent of contamination; remove the source of contamination (such as the impacted soils in contact with ground water or free hydrocarbon product); remediate, establish points of compliance, and monitor contaminant levels.

D. Pit Program: During FY 2007-2008, COGCC staff approved permits for 422 new pits and approved the closure of 22 pits, primarily in conjunction with plugging and abandonment of wells. Most of these new pits are located in Las Animas County and are associated with coalbed methane (CBM) wells. There are approximately 12,183 pits shown as active in the MRDB. COGCC environmental staff continues to verify this number as time allows.

An investigation of oil and gas exploration and production pits in Elbert County was completed on June 30, 2008. The investigation evaluated the accuracy and completeness of the information in the COGCC web-based information system (COGIS) database for facilities in Elbert County. During investigation the status of 176 pits in the COGIS database was evaluated. The investigation indicated that 115 of the pits were already closed and that there were approximately 53 duplicate records. Corrections are being made to the COGIS database and additional pit data assessment projects will be conducted as time and staff resources allow.

E. Permitted Centralized Waste Management Facilities: Non-commercial centralized exploration and production (E&P) waste management facilities are permitted by COGCC under Rule 908. The rule requires that operators apply for a permit and as part of the approval process, staff evaluates the proposed site, operation, financial assurance, and preliminary closure plans. Generally these facilities are larger than a typical tank battery that might handle wastes from only one or a few wells. These larger facilities handle wastes from many wells and wastes that may be from more than one field or lease and may include lined pits, landfarms, or tank batteries. These facilities are currently required to have financial assurance of \$50,000.

During FY 2007-2008 the COGCC permitted one (1) new centralized E&P waste management facility. There are twenty-three (23) active permitted centralized E&P waste management facilities in the state. There are two (2) centralized landfarms located on federal lands and that are not necessarily under the jurisdiction of the COGCC.

F. Disposal and Reuse of Produced Water: Approximately 45% of the water co-produced with oil and gas is disposed or used for enhanced recovery by underground injection. Most produced water that is not injected is disposed in evaporation and percolation pits or discharged under Colorado Discharge Permit System (CDPS) permit, and a small amount of produced water is used for dust suppression on oil and gas lease roads. In addition, to minimize waste and the use of fresh water, operators often reuse and recycle produced water and other fluids for drilling and well completion activities including fracing.

G. Onsite Inspections. In January 2005, COGCC adopted a policy to conduct onsite inspections where oil and gas wells are proposed on lands where the surface owner did not execute a lease or is not party to a surface use agreement. Under COGCC Rule 306, an operator is required to use its best efforts to consult in good faith with the affected surface owner with regard to locations of proposed wells and surface facilities, access roads, and final reclamation and abandonment. If the COGCC Rule 306 good faith consultation between the operator and the surface owner does not resolve operational issues related to the proposed well, the surface owner may request that the COGCC conduct an onsite inspection under the policy.

During the onsite inspection, the surface owner, operator, and COGCC staff meet at the location and discuss issues related to the proposed well and associated surface facilities. The local government designee may also attend if requested by the surface owner. Following the inspection, the COGCC may apply appropriate site specific drilling permit conditions, if necessary, to avoid potential unreasonable crop loss or land damage, or to prevent or mitigate health, safety and welfare concerns, including potential significant adverse environmental impacts. Any such conditions of approval must be consistent with applicable Commission spacing orders and well location rules, and must take into account cost-effectiveness, technical feasibility, protection of correlative rights, and prevention of waste. The COGCC can not require an operator to use an exception location, directional drilling techniques, or otherwise compromise its reasonable geologic and petroleum engineering considerations.

As of June 30, 2008, the COGCC has received one hundred ten (110) requests for onsite inspections. Sixty four (64) requests were withdrawn, twenty three (23) onsite inspections were conducted, and twenty three (23) onsite inspections were pending. Of the one hundred ten (110) requests received, fifty nine (59) were for locations in Weld County, twenty (20) in Las Animas County, seven (7) in Adams County, five (5) in La Plata County, four (4) in Garfield County, three (3) each in Boulder, Archuleta and Yuma Counties, two (2) in Morgan County, and one (1) each in Baca, Logan, Kiowa and Larimer Counties. Most surface owner concerns relate to impacts to irrigated land, aesthetic impacts, and effects on current and future land value.

Oil and Gas Conservation and Environmental Response Fund (Fund 170)

The COGCC receives an annual appropriation of \$312,033 that is used primarily by the environmental staff to respond to and investigate complaints alleging impacts from oil and gas operations and an appropriation of \$500,000 that can be used to conduct special environmental projects such as baseline ground water testing, gas seep investigations, regional investigations of potential impacts from oil and gas operations, and verification of COGCC information. Because of the COGCC's need to respond to emergency situations related to oil and gas operations, the COGCC has been appropriated \$1,500,000 for emergency response activities. In addition, the COGCC continues to receive an appropriation of \$220,000 for plugging and reclaiming abandoned wells.

In 2007 Special Environmental Projects included, conducting a statewide assessment of orphaned wells that were plugged and abandoned by the COGCC. Approximately \$144,327 of Fund 170 money was used to conduct this project. Soil gas data were collected at each well site, as well as digital photographs and global positioning system measurements of the well pad and at each soil gas sampling point. At four well sites, methane was detected above background concentrations. On behalf of the COGCC, a third-party contractor conducted a follow-up investigation for each of the four (4) locations in La Plata County to map in more detail the extent of the area with methane concentrations above background, to collect water samples from any nearby water wells, to collect gas samples from the subsurface for isotopic analysis, and to conduct soil gas surveys around any nearby buildings. The field investigation work was completed in mid-November and laboratory analysis of soil gas samples was completed in December 2007. Of the four (4) well locations subject to further investigation, two (2) were determined to have methane of thermogenic origin. These wells have been added to the COGCC's orphaned well list and will be remediated by the COGCC as part of this program.

In response to ever increasing levels of oil and gas development and movement of these activities into other parts of the state, COGCC staff conducted another baseline ground water investigation, this time for the Upper Crow Creek Designated Ground Water Basin in Weld County. Approximately \$25,000 of Fund 170 money was used for this study. The final report is available on the COGCC website Library, Denver Julesburg Basin reports. In addition, staff used approximately \$20,000 of Fund 170 money to complete a baseline ground water investigation for Moffat County that was started during the previous fiscal year. The final report for this study is available on the COGCC website Library, Piceance Basin reports. The COGCC also used \$150,000 of Fund 170 money to help fund the Division of Wildlife's (DOW) mule deer population study in the Piceance Basin.

In addition, a total of \$561,660 was spent by the engineering staff to plug and abandon and to reclaim orphaned oil and gas sites in Boulder, Fremont, Garfield, Jefferson, La Plata, Logan, Montezuma, and Weld Counties. Funding was a combination of claimed bonds, Fund 170, and approximately \$240,000 of emergency response monies.

Data Management and Geographical Information Systems (GIS)

A major function of the COGCC is the management of records and data related to exploration and production of oil and gas resources, and potentially related impacts. Historically, the majority of these records and data were available to the public as paper records filed in the COGCC Public Room, located in the Denver office. The number of records and volume of data available through the COGCC continues to grow each year. The Colorado Oil and Gas Information System (COGIS) allows staff and Internet users to access COGCC data through a relational database and imaging system. Almost all entries from COGCC permit/reporting forms are stored in the database. Data pertaining to wells, spills, complaints,

remediation, and pits are managed in the COGIS database system. In addition, almost all of the paper documents that have been submitted to the COGCC have been scanned, including a relatively complete set of geophysical well logs. Users are currently able to search the COGCC databases on the web, research information on individual wells and other related facilities, call up related scanned documents, and view plotted locations on the COGCC Online map system.

To ensure that local governments are informed, an Internet application has been developed to allow the local government representatives to view new permits and other well information in their respective areas of concern.

Improvements to the COGCC GIS Internet Map continue to be made. The map contains over 130 map layers including oil/gas wells, facilities (e.g. pits), roads, cities, counties, water wells, COGCC rule and policy areas, BLM land and lease information, topographic maps, color aerial photographs, and sample locations from baseline and other studies. The following new map layers were added in 2008:

- 1) Field Inspection Status Layer- This map layer was added to the Intranet and Laptop maps to assist COGCC field inspectors in planning their inspection priorities and routes. When the map layer is turned on, different colored symbols are shown at each well to depict the current inspection status.
- 2) COGCC Field Boundaries – The field boundaries are mapped through an automated process that draws polygons around a group of wells that share the same field name and code. These field boundaries are updated on a regular basis and posted on the GIS Online map.
- 3) Additional Regulatory Map Layers – Many new spacing orders were added to the COGCC Spacing Layer. In addition, a set of map layers were added to show Project Rulison monitoring zones Project Rio Blanco restricted lands, and the Roan Rim Notice to Operators Area.

Several GIS projects are currently underway. The directional wellbore project is about 60 percent complete. A few thousand “hard copy” directional reports need to be data entered before the mapping application can be run on a regular basis.

A new companion online map is being developed to support the 2008 rules. This map will include over 30 wildlife layers for the 1200-series rules and the CDPHE surface drinking water and groundwater under the influence (of surface water) protection areas for Rule 317B.

COGIS is currently available on laptop computers that allow the engineering and environmental staff to take the entire COGIS database and GIS Online Map System to the field for quick information queries while conducting investigations.

Online Access to Baseline and Special Studies Reports

The written reports for COGCC managed baseline sampling projects and other special environmental studies, such as the Coalbed Methane Stream Depletion Assessment Studies, are posted on the website under the tab “Library. Many of these reports are in PDF format and are primarily organized by basin. Ongoing pressure and water quality monitoring reports are also posted in this location. The Upper Crow Creek Designated Ground Water Basin Baseline Water Quality Study was recently added to the Library.

Industry Services

The COGCC continues to promote its mission to foster the responsible development of Colorado's oil and gas natural resources by providing information and assistance in complying with the COGCC rules and requirements, including our expanded website and GIS capabilities.

Industry Compliance/Violations/Penalties

In FY 2007-2008, the COGCC assessed penalties against 11 operators for violations of rules and orders. The total amount of penalties assessed was approximately \$478,300, of which \$442,300 was associated with enforcement for violations resulted in or had the potential to impact public health, safety, welfare, or water resources. The violations included:

- Failure to:
 - prevent unauthorized discharged or E&P wastes,
 - take precautions to prevent significant impacts to water resources,
 - obtain APD approval prior to drilling/recompletion,
 - remove oil from pits within 24 hours and remediate oily waste,
 - obtain pit permits,
 - provide valid data on permit,
 - remediate spills/releases
 - inject at permitted pressure
 - prevent waste of natural gas.

In response to numerous complaints from residents in an area of Huerfano County alleging impacts to their water wells from gas operations, the COGCC conducted an investigation and determined that there were very high concentrations of methane in a number of the water wells and that the occurrences of methane were related to coalbed methane (CBM) development in the area. As a result of the investigation the COGCC issued a Cease and Desist Order to an operator requiring them to shut-in all of their 52 gas wells and to develop and implement a mitigation and monitoring program. To date the 52 gas wells remain shut-in, methane has decreased dramatically in all of the water wells, and monitoring and mitigation continue.

Underground Injection Control (UIC)

COGCC staff will continue to work with WQCD and EPA staff to ensure that operators of Class II injection wells in Colorado are in compliance with ground water standards and classifications and points of compliance are established. Approximately 14 Class II UIC well permits were approved by the COGCC in FY 2007-2008.

3. COGCC COORDINATION WITH WQCD/WQCC

In FY 2007-2008 the COGCC, WQCD, and WQCC semi-annual meeting schedule was disrupted by the intensive demands placed on staff related to the COGCC rulemaking activities., Craig Wiant and Mark Cutright will be representing the WQCC and COGCC Commission, respectively, when the meetings schedule returns to normal.

4. RULEMAKING

The COGCC has been involved for most of this fiscal year in the rulemaking process to implement HB 07-1341, which requires rules to be promulgated in consultation with CDPHE, and HB 07-1298, which requires the COGCC to minimize adverse impacts to wildlife and promulgate rules in consultation with the DOW. The process included public meetings held throughout the state to solicit comments on the proposed rule concept document, and numerous meetings between representatives from the agencies and stakeholder groups, prior

to the release of the proposed draft rules.

On May 22, 2008, the Commission initiated the rulemaking hearing. Public comments were provided to the Commission at hearings in Grand Junction and Denver, prior to thirteen days of presentations by the parties to the Commission during June, July and August. The Commission deliberated on the proposed rules on August 19 and 20, provisionally adopting a total of 50 rules. Deliberations continued on September 9 through 11, with 32 rules provisionally adopted, and on September 22 and 23, with 5 rules provisionally adopted. The Commission completed its deliberations on October 26 and 27, with 14 rules provisionally adopted. Final rule adoption is scheduled for the December 2008 hearing. For the latest information, to review the proposed rules, and to review all documents and comments submitted on the draft rules, a special rulemaking page has been established on the COGCC website at www.cogcc.state.co.us

5. OIL & GAS EXPLORATION & PRODUCTION ACTIVITY IN COLORADO BY REGION/FIELD

This section summarizes oil and gas activities within the State of Colorado and highlights COGCC studies, issues and concerns relating specifically to ground water by region. In each region there are remediation projects of various size and type in which impacted soils and/or ground water are being investigated or cleaned up by operators. Not all of the projects are described individually in this report. The COGCC environmental staff directs and monitors these projects, as described in Section 1.

By the end of CY 2008 there will be approximately 37,000 active oil and gas wells in Colorado. These wells produce approximately 3.5 billion cubic feet (bcf) of natural gas and 65,000 barrels (bbls) of oil per day. The value of these is estimated to be \$7.15 billion dollars for CY 2007.

The activity of the oil and gas industry may be measured in part by the number of drilling and recompletion permits processed by the COGCC. It is estimated that by the end of CY 2008 the COGCC will have approved approximately 7,700 drilling permits, which is an increase of approximately 21% from CY 2007.

SOUTHWEST COLORADO

Oil and Gas E&P Activity

Most of the gas produced in the southwestern part of Colorado comes from coalbed methane (CBM) wells. Drilling activity has increased notably in response to increased well density in certain counties. In FY 2007-2008 approximately 424 permits for new wells and recompletions of existing wells were approved. Currently there are approximately 3,030 active wells in La Plata County. These wells produce approximately 1.2 bcf of natural gas per day, which is approximately 38% of the total gas production in the state. Also there are approximately 434 active oil, gas, and carbon dioxide wells in four other southwestern Colorado counties, including San Miguel, Dolores, Montezuma, and Archuleta. Approximately 93% of the carbon dioxide produced in the state is produced from wells in Montezuma County.

Public Involvement

La Plata County Gas and Oil Regulatory Team (GORT)

The COGCC established the La Plata County Gas and Oil Regulatory Team (GORT) to provide a forum for meaningful dialogue between operators, citizens, La Plata County, the Southern Ute Indian Tribe, the Bureau of Land Management (BLM) and the COGCC. Archuleta County representatives also participate in this group. Members of this group continue to fund and provide technical support for the ongoing monitoring of methane seeps along the Fruitland Coal outcrop.

Northern San Juan Basin Stakeholders Group

In July 2006 the USFS and US BLM issued the final Environmental Impact Statement (EIS) for the Northern San Juan Basin. As an outgrowth of the EIS process, the USFS and US BLM established the Northern San Juan Basin Stakeholders Group to provide a forum similar to the GORT group that reaches into Archuleta County and more directly addresses issues relating to oil and gas development within the EIS geographic area.

Ground Water and Other Environmental Issues

Conditions for Optional Additional Coalbed Methane Wells

As a result of COGCC Orders 112-156 and 112-157 and other orders related to CBM development in the San Juan Basin, operators have collected approximately 3,620 water samples from 1,491 water wells. The analytical results have been submitted to the COGCC and to the land owners. To date impacts to water wells from CBM wells drilled under these orders have not been detected.

3M Project

Methane gas has been observed seeping from the outcrop of the Fruitland Formation in many areas along the northern margin of the San Juan Basin, in southwestern Colorado. Some of these seeps were identified prior to the initial development of any Fruitland Coal wells; however, in places the intensity and areal extent of these seeps appears to have increased subsequent to CBM production. In addition, what appear to be new seeps have been identified in some areas. Questions persist about whether gas seepage at the newly identified areas and expanding seeps could be due to CBM production.

The COGCC and the US BLM funded the installation of a network of monitoring wells at four locations between the outcrop of the Fruitland Formation and down basin production. The wells are equipped with transducers and data loggers and will be used for the long term monitoring of pressure and water levels in the Fruitland Formation. A total of seven (7) wells, were completed and data are being collected. Pressure monitoring data from these wells are available on the COGCC website.

During FY 2007-2008, approximately \$25,000 in Fund 170 money was used for the operation and maintenance of these wells, and report preparation.

Fruitland Outcrop Study La Plata County and Archuleta County

Industry, La Plata County, BLM, and the COGCC continue to contribute money and/or staff for the ongoing evaluation, maintenance, and monitoring of the 140 permanent soil gas monitoring probes and one meteorological station. Aerial surveying with infrared imagery technology is also being used to detect areas of stressed and/or dead vegetation, which can be an indication of methane gas seepage. This detailed work has been expanded to cover the entire Fruitland Formation outcrop in La Plata County and Archuleta County on land north of the Southern Ute

Indian Tribe Reservation boundary. The expanded survey includes the mapping of springs discharging from the Fruitland Formation. The 2003, 2004, 2005, 2006 and 2007 La Plata County reports are available on the COGCC website www.cogcc.state.co.us Library, Area Reports, San Juan Basin, 3M Project Reports. The 2004, 2005, 2006 and 2007 Archuleta County reports are available on the COGCC website www.cogcc.state.co.us Library, Area Reports, San Juan Basin, Archuleta County. The report of the results of the 2008 field work in La Plata and Archuleta Counties will be posted on the COGCC website when they are finalized.

4M Project

The COGCC received an appropriation of \$4,452,000 from Fund 170 to fund the Fruitland Formation Seep Mitigation Project in La Plata County and the Fruitland Formation Outcrop Monitoring Project in Archuleta County; collectively known as the 4M Project. The COGCC will spend up to \$2,944,000 of this appropriation to evaluate methods for mitigating the seepage of methane gas and to expand the existing monitoring network along the outcrop of the Fruitland Formation in La Plata County, and up to \$1,508,000 to install monitoring wells in the Fruitland Formation in Archuleta County. The COGCC Commission approved a mill levy increase under §34-60-129 C.R.S. which was required to fund the 4M project.

The first phase of the 4M project was to install, test and operate two (2) pilot scale methane gas mitigation systems in La Plata County, one along the South Fork of Texas Creek and one in the Pine River Ranches subdivision. Methane gas escapes to the atmosphere via surface seeps at these locations, killing vegetation and creating safety hazards. The intent of each system is to capture the gas in the shallow subsurface and route it to a combustion chamber where it can be used to generate electricity to power the mitigation system. COGCC awarded the contract for this work in May 2008. The system was designed during the summer of 2008 with review by the Technical Working Group (TWG). Installation of the systems began in October 2008. Operation and testing of the systems will extend into late-2009.

Additional monitoring wells are also scheduled for installation in La Plata County under 4M funding. COGCC staff is working to obtain surface use agreements with private landowners in areas where there are no Fruitland Formation monitoring wells. Several locations have been identified and once all access issues are addressed a Request For Proposal (RFP) for monitoring well installation will be issued. Field work is expected to commence in mid- to late-2009.

A Scope of Work for installation and monitoring of Fruitland Formation monitoring wells in Archuleta County was developed and a Request for Proposals (RFP) for the Fruitland Formation Geologic Characterization and Reservoir Pressure Monitoring (PHA-837) was posted on April 24, 2008 and on July 17, 2008 the COGCC awarded the contract. The project involves construction of monitoring wells at several locations along the eastern edge of the San Juan Basin in Archuleta County. Six monitoring wells have been drilled and completed and have been equipped with pressure transducers and telemetry systems to monitor Fruitland Formation pressure and water levels. Core samples of the Fruitland coals were collected and both coal and desorbed methane will be tested. Scorpion Drilling provided and operated the drilling rig and used a closed loop system to minimize surface impacts.

An additional aspect of the 4M Project included mapping of the outcrop of the Fruitland Formation and adjacent formations along the eastern edge of the San Juan Basin in Archuleta County. To this end, the COGCC implemented an interagency agreement with the Colorado Geological Survey (CGS) to conduct the mapping, which is similar to mapping done in 1999-2000 by the CGS as part of the 3M Project. The work included mapping the surface expression of the uppermost Cretaceous units including, Pictured Cliffs Sandstone, Fruitland Formation, Kirtland Shale, for approximately 23 miles along the rim of the San Juan Basin in Archuleta

County between the La Plata-Archuleta County line and the northern boundary of the Southern Ute Indian Reservation.

In addition to mapping unit contacts, the study included measurement and analysis of fractures in these formations and mapping of individual coal beds in the Fruitland Formation. Field work began in May 2008 and was completed in late July 2008. Compilation of data and report production is ongoing. Twenty-two measured sections were completed or compiled from previous work. CGS used faculty and staff from Fort Lewis College in Durango and the University of Colorado - Denver to assist in the mapping project.

When completed, the final report will be added to the Library section of the COGCC website. Formation contact data will be made available as a layer on the COGCC online GIS maps.

Citizen Complaints, Spills and Other Issues Regarding Ground and Surface Water

The COGCC received 47 complaints alleging impacts from oil and gas operations. Of these 11 complaints alleged impact to water wells or requested baseline sampling. COGCC staff determined that all of the water well complaints were either not related to oil and gas activities or not enough data were available to make a conclusive determination and require further investigation. In addition, staff continues to monitor several water wells previously impacted by an orphaned gas well, which has been plugged by the COGCC. In FY 2007-2008 Approximately \$50,000 of Fund 170 money was used to investigate these complaints and requests and to conduct the ongoing monitoring.

The COGCC received 39 complaints regarding other environmental damage or operational issues. Of these 18 were noise complaints, 10 were related to reclamation or surface damage issues, and five (5) were related to royalty, production, or well spacing issues. The remaining complaints were related to trespass, odors and dust COGCC and were referred to the appropriate agencies or legal counsel. Fifteen (15) NOAVs were issued to operators in response to these complaints.

Thirty-one spills/releases of E&P waste were reported in La Plata, Archuleta and San Miguel Counties. Of these, four (4) were releases to surface water; there were no reported releases to ground water. NOAVs were issued for two (2) of the surface water releases and an EPA action is pending on a third. Analytical testing indicated no impact on the fourth spill and no further action was required.

COGCC staff and 3rd party contractors continue to investigate and monitor soil and ground water impacts associated with methane leakage from a 1930's orphan oil and gas well (Bryce 1-X). COGCC has shown this well and a previously plugged and abandoned orphan well (Nick Spatter Bryce Farm #1) were the sources of the elevated levels of methane in the subsurface soils and in six (6) nearby water wells. Fund 170 money has been used to respond to this emergency situation, install methane monitors and alarms in three homes, a fire station, and a water well house, to continue monitoring of the aerial extent of the gas seepage, and to investigate and identify the source of the gas. In July and August 2006 COGCC staff and a 3rd party contractors successfully plugged and abandoned the Bryce 1-X. This resulted in a decrease in the concentration of methane in the soil. Methane has not been detected in the soil and shallow subsurface since July 2007. Elevated concentrations of methane persist in the ground water and water wells; however ongoing ground water sampling indicates a gradual decrease in the methane concentration in each well.

NORTHWEST COLORADO

Oil and Gas E&P Activity

Northwest Colorado continues to experience a high level of oil and gas activity, especially in Garfield and Rio Blanco Counties. Northwest Colorado drilling permits account for 50 percent of the state total with the most new drilling permits issued in Garfield County. The driving force behind this active development continues to be the extensive natural gas reserves in the Piceance Basin, and an expanding pipeline infrastructure that enables improved marketing of natural gas from the area.

Public Involvement

The Northwest Colorado Oil and Gas Forum

The Northwest Colorado Oil and Gas Forum (NWCOGF) meets quarterly in Rifle. The NWCOGF is an important forum for the discussion of oil and gas issues and concerns at the local level. The participants include of the COGCC, other federal, state, and local government agencies, the oil and gas industry, and concerned landowners and citizens. Meetings are well attended by the various stakeholders.

Southern Piceance Basin Water Resource Project

The COGCC has been cooperating with the USGS on the development of a common repository for water quality data. Significant water-resource data sets, publications, and other materials have been developed for the Southern Piceance Basin. However, those data are currently stored in disparate formats among numerous agencies, energy companies, private consulting firms, universities, and stakeholder groups. The common data repository will greatly improve understanding of factors affecting water resources in the Southern Piceance Basin.

Environmental Issues

Approximately \$31,000 of Fund 170 money was spent investigating citizen complaints or requests for baseline sampling, spill/release reports submitted by operators, and the findings of COGCC field inspections in northwestern Colorado. In accordance of the MOA for Response to Spills/Releases to Surface Water, the COGCC notified the CDPHE of releases impacting waters of the state. In all cases where ground water was impacted, operators are required to conduct a site investigation and perform appropriate remediation to comply with COGCC requirements.

Ground Water

There were sixteen (16) complaints alleging impacts to water wells or requesting baseline sampling in the northwestern portion of Colorado. Upon investigation, COGCC staff determined that one (1) of the water wells had been impacted by contamination associated with a release from a gas well that occurred in 1997. The operator of the gas well is continuing the remediation, monitoring, and mitigation of the impacted ground water.

Surface Water

The COGCC investigated a variety of releases either impacting or threatening to impact surface waters in northwestern Colorado. There were ten (10) complaints alleging impacts to springs. Upon investigation, COGCC staff determined that seven (7) of those springs had been impacted. There were seven (7) spill/release events in which E&P waste fluids reached surface water. In cases where surface water was impacted, the operators responded with appropriate emergency procedures and other corrective measures to comply with COGCC and WQCD requirements. Finally, there were five (5) spill/release events in which E&P waste fluids reached dry drainage features leading to surface water. In each of the above-mentioned situations, the COGCC has enforced on the responsible operators or enforcement actions are pending.

Drilling Near Project Rulison Test Site

In 1969, the Atomic Energy Commission, a predecessor to the U.S. Department of Energy (DOE), conducted several experiments on the use of nuclear devices to enhance natural gas production from wells. The project conducted in Garfield County is known as Project Rulison and the well in which the nuclear device was detonated is located on Battlement Mesa.

In 2005, Presco Corporation (PRESCO) submitted APDs for and began drilling a number of wells in Garfield County in the vicinity of Project Rulison, but outside the 0.5 mile buffer zone established by the COGCC. To address concerns regarding the potential for new gas wells to intercept materials impacted by the nuclear test, Presco agreed to conduct a monitoring program to test for a number of radionuclides. This monitoring program included background monitoring of non-impacted gas and water from the Williams Fork and overlying formations, of surface and ground water in the vicinity, and monitoring of drilling mud, cuttings and gas brought to the surface during drilling, completion, and production at selected locations. Reports summarizing the results of the 2004 Baseline and the 2005 and 2006 Annual Water Sampling activities conducted by Presco have been submitted to the COGCC. Reports summarizing the results of Gas Well Drilling Monitoring activities have also been submitted by Presco to the COGCC. These reports are available on the COGCC website, www.cogcc.state.co.us Library.

The U.S. Department of Energy – Office of Legacy Management (DOE-OLM) completed a draft report presenting the results of a natural gas fate and transport flow model for the Williams Fork Formation in the vicinity of the Project Rulison test site in September 2007. The model and report were reviewed by the staff of the COGCC, the Radiation Management Unit of the CDPHE, and Dr. John McCray of the Colorado School of Mines. Resulting comments and suggestions are being addressed in the final report, which is expected in 2009.

In October 2007, an informational session was held as part of the regular Commission hearing. During this informational session, presentations were given by COGCC staff, the CDPHE, and the DOE regarding the history of the Rulison test, monitoring efforts, and a summary of the draft results of the fate and transport modeling study. In addition, landowners in the area and operators were provided an opportunity to present their concerns and opinions regarding energy development in the area of the Rulison test site.

After acquiring PRESCO's interests in the Battlement Mesa area in May 2007, Noble and other operators in the area began preparation of a Sampling and Analysis Plan (SAP) for monitoring of materials produced during drilling and production of wells in the vicinity of the Project Rulison test site. In December 2007, Noble, Williams and EnCana produced a draft SAP that specifies sampling frequency and required analyses for organic, inorganic and radionuclide constituents in drill cuttings, produced gas, produced water and shallow area groundwater. In addition, a procedure was developed and implemented for real time monitoring of tritium and other radionuclide constituents of interest.

The draft SAP was reviewed by staff of the COGCC, CDPHE and DOE-OLM in addition to experts retained by the COGCC. Comments and suggestions were provided to the operators and were incorporated into a revised SAP, which was approved by COGCC, CDPHE, and DOE staff, pending incorporation of final comments. At the January 2008 Commission hearing, an overview of the SAP was presented to the Commission as well as comments from other interested parties. Additional revisions to the SAP regarding specific inorganic analyses for produced water were incorporated into a second revision of the SAP submitted to the COGCC in March 2008.

The most recent version of the SAP, comments from regulatory agencies and other interested parties, and quarterly monitoring reports are available in the Library, Piceance Basin section of the COGCC website.

West Divide Creek Gas Seep Remediation Update – Garfield County

In accordance with the COGCC requirement for periodic reporting on the ongoing remediation of shallow ground water contamination at the West Divide Creek Seep, EnCana provides quarterly reporting on the status of the seep remediation and these status reports are available on the COGCC Library website under Piceance Basin. The low-flow air sparge system designed to remediate shallow ground water contaminated with benzene, toluene, ethylbenzene, and total xylenes (BTEX), continues to decrease concentrations and aerial extent of these compounds in the impacted area. The concentration and aerial extent of thermogenic methane in the ground water in the impacted area also continues to decrease although at a lower rate than the BTEX compounds. There were no detections of BTEX compounds in any West Divide Creek surface water sample locations in FY 2007-2008.

Orphaned Wells and Sites

Approximately \$ 278,000 of Fund 170 money was used to plug and abandon, restore and reclaim orphaned sites in northwestern Colorado. This included \$250,000 from the portion of the fund that is earmarked for emergency response. Proper plugging and well abandonment ensures that the fresh water aquifers and surface water are protected from fluid migration in the boreholes. Projects included:

Plugging and abandonment of one (1) orphaned well in Garfield County.

Plugging and abandonment of one (1) orphaned well in Delta County.

Plugging and abandonment of one (1) orphaned well and reserve pit in Moffat County.

Plugging and abandonment of seventeen (17) orphaned Mancos wells in Rio Blanco County.

DOW Mule Deer Study

COGCC and DOW have a common interest in planning and managing oil and gas operations in a manner that balances development with wildlife conservation in recognition of the state's obligation to protect wildlife resources and the hunting, fishing, and recreation traditions they support. Therefore COGCC has a direct interest in the success of DOW's mule deer population performance study that focuses on developing strategies to avoid, minimize, and mitigate impacts to wildlife habitat from oil and gas activities in the Piceance Basin. The primary goal of this study is to develop approaches to provide for energy extraction in a manner that maintains viable mule deer populations for future recreational and ecological purposes. This may be accomplished using 2 general strategies: 1) modify energy development practices, and 2) enhancing nutritional quality of key habitats.

To test these strategies, the CDOW is monitoring changes in the following four areas: (1) mule deer movement patterns, (2) adult female deer body condition, (3) over-winter fawn survival, and (4) deer density, in response to selected improved development practices and/or habitat treatments and will determine which practices will be most beneficial to implement for future sustainability of viable mule deer populations exposed to energy development. The monitoring will be conducted over the planned ten year duration of the study.

During FY 2007-2008 DOW collaborated with COGCC, industry, and other stakeholders to

develop a scope of work and began pretreatment monitoring. In FY 08-09 DOW will continue pretreatment monitoring and prepare a detailed progress report.

In FY 2007-2008 the COGCC used \$150,000 of Fund 170 money to help DOW purchase radio-collars that will be placed on female mule deer this winter. The transmissions from the collars will be used to track deer movement.

NORTHEAST COLORADO

Oil and Gas E&P Activity

Oil and gas activity in the northeastern portion of the state remains high. In 2007, approximately 24% of the total number of well permits were issued to operators in Weld County and approximately 8% were issued to operators in Yuma County. Smaller oil fields with lower levels of activity are located in other counties throughout northeast Colorado.

Public Involvement

COGCC staff continues to receive and follow-up on complaints from the Weld County Department of Public Health & Environment, Tri-County Health Department, Larimer County Environmental Advisory Board, Morgan County Office of Emergency Management, Northeast Colorado Health Department, other municipalities, and the public throughout northeastern Colorado.

Environmental Issues

Approximately \$28,000 of Fund 170 money was spent investigating citizen complaints or requests for baseline sampling, spill/release reports submitted by operators, and the findings of COGCC field inspections in northeastern Colorado. Samples were collected and analyzed from 32 water wells and one stream.

Ground Water

In all cases where ground water was impacted, operators are required to conduct a site investigation and perform appropriate remediation to comply with COGCC requirements. In addition, the COGCC continues to oversee the investigation and remediation of contaminated soil and ground water associated with gas plants and compressor stations throughout northeast Colorado.

Upon investigation, COGCC staff determined that one (1) water well had been impacted by thermogenic gas. The investigations to identify the sources of the gas in this water well continue. The owner of the impacted water wells and the operators have reached a private settlement that includes a hook up to a public drinking water source.

Surface Water

There were four (4) spill/release events in which E&P waste fluids reached surface water. These were reported to the WQCD in accordance with our MOA. In cases where surface water was impacted, the operators responded with appropriate emergency procedures and other corrective measures to comply with COGCC and WQCD requirements.

Arapahoe Aquifer Baseline Water Quality Study – Adams County

COGCC staff contracted with Lepert Associates, Inc., of Golden, Colorado to conduct baseline ground water quality sampling of twenty (20) water wells completed in the Arapahoe Aquifer in Adams County in Townships 1 and 2 South, Ranges 59 through 64 West. Field sampling was completed in late June 2007. Water wells were sampled for general water quality parameters and dissolved methane concentrations. No impacts from oil and gas activities were detected. The project cost was \$25,000 with the funding coming from the Special Environmental Protection and Mitigation Studies line item of Fund 170. A copy of the final report is available on the COGCC website Library.

Upper Crow Creek Designated Groundwater Basin – Northern Weld County

The COGCC used Fund 170 money to conduct a baseline water quality investigation in the Upper Crow Creek Designated Groundwater Basin in northern Weld County. Twenty three (23) domestic water wells and one municipal water well in selected townships within the basin were sampled. This project significantly expanded the COGCC database of analytical data for ground water in this area. Analytical data are one of the primary tools used by the COGCC staff in responding to landowners who allege impacts to water wells from oil and gas activities. These and other available data will be used by staff to determine whether impacts to ground water resources from oil/gas operations have occurred. A total of approximately \$24,900 of Fund 170 money was spent in FY 2007-2008 on this project.

Orphaned Wells and Sites

Approximately \$177,000 of Fund 170 money was used to restore and reclaim orphaned sites in northeastern Colorado. Proper plugging and well abandonment ensures that the fresh water aquifers and surface water are protected from fluid migration in the boreholes. Projects included:

Plugging and abandonment of one (1) well site in Boulder County,

Reclamation of two (2) former well sites in Adams County.

Reclamation of a former gas plant in Logan County.

Plugging and abandonment of three (3) well sites in Washington County.

SOUTHEAST COLORADO

Oil and Gas E&P Activities

Southeastern Colorado produces conventional gas, CBM gas, and crude oil from several basins, including the Raton, the DJ and the Hugoton Embayment. Approximately 1.27 bcf of gas is produced in this region with 91.3% of the gas is produced from wells in Las Animas County. A total of 1,935,809 barrels (bbls) of crude oil were produced in FY 2007-2008 with Cheyenne County accounting for 80.5% of the production.

There are approximately 3,529 active wells within the region; 2,722 of the wells are located in Las Animas County. The most active area continues to be the Raton Basin with 517 applications for permits to drill (APDS) submitted in FY 2007-2008. In the remaining counties a total of 62 APDS were submitted.

Approximately 168,879,347 barrels of produced water were generated in Southeast Colorado during FY 2007-08. Ninety one (91) per cent of the produced water was generated from wells in Las Animas and Huerfano Counties. Produced water is managed by underground injection, surface water discharge and in evaporation/percolation pits. There are eighty five (85) active injection wells in this region; 40 in Cheyenne County, 16 in Las Animas County, 13 in Baca County, nine (9) in Kiowa County, and seven (7) additional wells in various counties.

Public Involvement

COGCC staff participated as a stakeholder in the Colorado Water Quality Forum Agricultural Diversion Work Group. The *Policy for Implementing the Narrative Standard in Discharge Permits for the Protection of Irrigated Crops* was finalized on March 10, 2008.

The work group consists of representatives from the oil and gas industry, the Colorado Water Quality Control Division (WQCD), irrigators, the agriculture community and wastewater treatment facilities. The workgroup plans to meet in early 2009 after permits are issued that incorporate the narrative standard. Norwest Applied Hydrology (on behalf of Pioneer Natural Resources) installed and maintains continuous monitoring stations in the Apishapa River drainage in an attempt to better define possible impacts from WQCD permitted discharges of CBM produced water into the waters of the state. Temperature, conductivity and pressure are monitored at three locations in the watershed. Local irrigators have been granted access to data collected from these stations. The measurement of pressure can be used to estimate flow. The conductivity of the water can be used to calculate sodium adsorption ratio (SAR) by comparison with laboratory measured sodium, calcium and magnesium concentrations collected on a monthly basis.

Environmental Issues

Approximately \$223,000 of Fund 170 money was spent investigating citizen complaints and requests for baseline water sampling and findings of COGCC field inspections, and conducting special projects and emergency response actions. The citizen complaints included water well investigations, surface water sampling, investigating pit overflows and leaks, spring and soil sampling. The special projects included two ground water monitoring projects, soil sampling at an abandoned pit, and gas sampling at a leaking P&A gas well. A methane monitoring project was also completed including soil surveys, ground water sampling and well testing and monitoring.

Ground Water

Thirty-three (33) water wells were sampled during FY 2007-2008. Six water wells were sampled in response to landowner allegations of impacts from oil and gas operations, twenty-seven (27) were sampled to establish baseline conditions.

▪ Alleged Impacts

Two landowners in Huerfano County alleged that toluene was present in their wells as a result of CBM operations in the area. Water samples were collected from each well on three occasions. Two nearby water wells were also sampled as were two nearby CBM wells. Toluene was not present in either of the neighboring water wells. The concentration of toluene in one complainant's well was approximately 1µg/l or less at each sampling event. Toluene was present in the second water well at concentrations between 70-140µg/l. Toluene was not detected at two neighboring water wells, which were completed at shallower depths than the CBM wells. Toluene was not detected in produced water from one of the CBM wells sampled.

Toluene was detected in produced water from one nearby CBM well at a concentration of less than 1µg/l. In addition, the overall inorganic chemistry of the water from the water wells is different than the CBM produced water. Based on the analytical data, staff concluded that CBM operations were not the source of toluene detected in the water wells.

One water well owner in Las Animas County alleged that the quantity of water as well as the quality of water from his domestic well had been impacted by nearby CBM operations. Upon investigation his well had not gone dry as he alleged, but his circuit breaker had been triggered while he tried to operate his well with a generator instead of line power as wired. The static water level was similar to the water level measured when the well was drilled 25 years ago. Overall the quality of the water was good with no parameter tested exceeding the groundwater standards. The domestic well water was a calcium-sulfate type water and not sodium-bicarbonate type water as is typical of most CBM produced waters in the Raton Basin.

Another landowner in Las Animas County alleged that water from his well was impacted by a drilling operation approximately 1,000 feet from his well. According to the landowner the well water became cloudy during the drilling of the CBM well. Samples of the water, the particulates, and gas were collected from the water well. The particles were analyzed by several techniques including X-ray diffraction in an effort to characterize them. The particles in the well are predominantly naturally occurring quartz, feldspars and clay minerals. These particles are likely from the formation in which the well is completed and are being carried into the well bore by methane and water. The isotopic composition of the methane in the water well is very different from the isotopic composition of the methane in four nearby producing gas wells, including the two wells alleged to have been the cause of the impacts to his water well. Many water wells in the Raton Basin are completed in coal bearing units and the well with alleged impacts appears to be one of these. As water is withdrawn from the water well and used by the landowner, the pressure decreases in the aquifer and methane desorbs from the coal seams. This is the same process used to produce methane in the CBM gas wells. Based upon the analytical data, it does not appear that this well was impacted by oil and gas activities.

Another water well owner in Las Animas County alleged that groundwater from his well contained large amounts of iron as a result of nearby CBM operations. The well produces from a shallow alluvial aquifer. The well is located in a cattle pasture and the owner does not keep a sanitary seal cap at the top of the casing. The well water is calcium-sulfate type and the iron is present as particles in the water. Investigation of this complaint determined that the steel casing installed at the top of the well is deteriorating and appears to be the source of the iron particles in the well water. No impacts from CBM operations were found at this well.

A well owner in Las Animas County alleged that the quantity of water produced from his domestic well had decreased significantly as a result of nearby CBM activities. The chemistry of water in his well indicates the domestic well is completed in a coal seam. The water is of a sodium-bicarbonate character with relatively high dissolved methane. Samples were collected from his water well and three nearby CBM wells. The samples were analyzed for general inorganic chemical parameters. Isotopic composition of methane in the samples was also analyzed. The results are inconclusive and COGCC staff will be continuing our investigation of this complaint to achieve a better understanding of the geology and hydrology of the area in an attempt to resolve whether the water well has been impacted by CBM operations.

Fourteen (14) samples were collected from wells in south central Huerfano County after thermogenic methane from coals was determined to be present in groundwater in the area. Methane was venting from several of the water wells at rates as high as 120 MCF/day. Analysis of gas samples from several of the water wells showed that it was thermogenic

methane similar in composition to the gas from the Vermejo Formation in this area. The water well impacts in Huerfano County are discussed in more detail in a separate section.

- Baseline Sampling

Twenty-seven (27) water wells were sampled at the request of landowners to establish baseline conditions prior to drilling. Overall the water quality in the sampled wells is good.

- Huerfano County Methane in Water Wells

As part of the ongoing investigation, monitoring, and mitigation efforts conducted by a CBM operator in response to impacts to water wells, more than 70 water wells are routinely monitored for methane. Gas samples have been collected from approximately 20 water wells. Stable isotope analysis of these samples indicate that the gas is thermogenic and similar to the CBM gas produced from the Vermejo Formation. The operator's CBM wells remain shut-in as specified by order of the COGCC Commission.

The operator has also installed a monitoring well, three removal wells and eight injection wells (permitted through the DWR) as part of the remediation and investigation activities. The removal wells have been acting as passive vents for methane since they were completed in spring of 2008. The results of the testing of the removal and injection wells were summarized in a report submitted at the end of September, 2008, which is available on the COGCC website Library. The operator has requested approval from the U.S. EPA to inject Poison Canyon water that is withdrawn from the "removal wells" into eight Poison Canyon injection wells. That approval is pending.

- North Fork Ranch Water Well Impacts

COGCC Staff and a gas operator continue to investigate and monitor two (2) domestic water wells in the North Fork Ranch (NFR) subdivision in western Las Animas County that were impacted during the drilling of a nearby CBM well. The water wells were sampled 26 times as part of the NOAV response, site investigation, monitoring, and remediation process. The analytical data indicate that water quality has returned to baseline conditions with the exception of manganese which continues to persist at levels above the Regulation 41 Drinking Water Standard of 0.5 mg/l in one of the domestic wells. The gas operator paid for the installation of a water treatment system for this water well owner. COGCC staff is pursuing enforcement on this matter. The gas operator has installed four monitoring wells in this area. The monitoring includes downhole continuous monitors for pressure and conductivity. Water samples are collected and analyzed on a regular basis and the results of the monitoring well system are reported to the COGCC on a semi-annual basis. The initial three monitoring wells were installed in late November 2006 and one domestic well was added to the monitoring network in 2007. No pressure upsets have been observed since installation of the monitoring network.

- Lincoln County Groundwater Impact

The investigation and remediation of a well site in Lincoln County continued this fiscal year. The soils and groundwater at this site were impacted due to the improper management of E&P waste. The issue was first observed during a site inspection conducted by a COGCC Field Inspector. The operator has submitted a Form 27 Site Investigation Plan and has conducted an extensive soil and groundwater investigation. The investigation has included the installation of monitoring wells and ground water and soil sampling. Analytical data indicates that the shallow alluvial aquifer has been impacted by produced water. Additional work has

included the excavation and remediation of the pit and removal of all production equipment from the site.

Benzene, ethyl benzene, toluene, or total xylenes have not been detected in groundwater samples, but elevated levels of total dissolved solids and chlorides were identified. The extent of the plume has been determined and points of compliance established. No water wells have been impacted.

A total of 7,200 cubic yards of soil have been removed from the site including 2,000 cubic yards of salt contaminated soils and 5,200 cubic yards of hydrocarbon impacted soils. The material is being trucked to a solid waste facility. Closure samples indicate that allowable total petroleum hydrocarbon levels have been reached, but remaining soils in some areas still exceed the allowable sodium absorption ratio. An environmental consulting firm is assisting the operator and will submit an addendum to the Form 27 to provide long term groundwater monitoring, additional soil remediation, and reclamation plans.

- Springs

No impacts to springs were observed in the past year.

Surface Water

- Stream Depletion Study

In November 2006 the COGCC, in conjunction with the Colorado Geological Survey (CGS) and the State Engineer's Office Division of Water Resources (DWR), evaluated proposals to conduct a stream depletion study in the Raton Basin. The purpose of this study was to develop a quantitative assessment of the levels of stream depletion or reduction in formation outflows (spring flows or flowing stream systems gaining from contact with formations), if any, that may be occurring as a result of the removal of water by CBM wells, in addition to defining areas where the ground water in the coal seams in the Raton and Vermejo Formations is tributary or non-tributary to the surface water flow system. This study was funded by the CGS and the contract was awarded to S.S. Papadopulos and Associates of Boulder, Colorado. This study has been completed. The analysis indicates that stream depletion from all wells producing in the Colorado portion of the Raton Basin is approximately 2,500 acre-feet per year.

Two operators in the Raton Basin have conducted a more detailed stream bed depletion study of a portion of the Purgatoire River drainage using ground water modeling (MODFLOW) and data from more than 1,000 CBM wells. The operator funded study concluded that depletions in the upper Purgatoire drainage were less than calculated by the Glover model, which used in the state funded study. The operator funded study has been submitted to the Office of the State Engineer for analysis and review.

- Spills of E&P Waste to State Waters

There were nine (9) spills/release events in which E&P waste entered waters of the state. E&P waste included produced water, drilling fluids and drill cuttings. These nine (9) events occurred within the Raton Basin. Two spills were caused by frozen pipelines that ruptured. Three spills involved human error of valves being closed while water was pumped into the line, resulting in rupture of the lines from overpressure. The other four spills were also caused by human error such as failing to remove water from a pit as production continued and

the pit exceeded its capacity. Surface water samples were collected and analyzed and no impacts to water quality standards were noted. WQCD staff was notified as required under the MOA between WQCD and COGCC.

- Surface Water Complaints

One complaint alleging impacts to San Pablo Canyon from sediment was received. A private subdivision road crosses the creek just upstream of where the muddy run-off was observed by the complainant. Upon inspection several horses were found to be grazing in and near the stream in the area and activities of the horses appeared to be causing the muddy stream. The operator who uses the subdivision road also installed several filtering BMP's near the area. No further actions were taken as a result of the complaint.

Stormwater

Two complaints were received regarding stormwater and erosion control failures in the Left Hand Fork of Logging Canyon in the North Fork Ranch subdivision in Las Animas County. WQCD staff was also contacted by the landowners and by COGCC staff regarding these issues. Field inspections and investigations were done by COGCC staff and a contractor to the WQCD along the several mile length of road and pipeline construction that is following the subdivision road. Monitoring of the erosion control process in the canyon is on-going. Two NOAV's are expected to be issued as a result of this investigation. This complaint was also forwarded to the WQCD for review. A subsequent inspection indicated that the facility was not in compliance with the WQCD stormwater permit.

Two other complaints regarding sediment and erosion control failures were received from landowners in the North Fork Ranch area. After investigation, NOAVs were issued to the operator.

NOAVs regarding erosion control problems in the Bosque del Oso SWA noted during COGCC field inspections were issued to the operator. The WQCD was informed of the problems in this area and used a contractor to review the storm water management plan of the operator and conduct field inspections of the area.

Phase II - Methane Seep Mapping and Monitoring Program

The Phase II Raton Basin Gas Seep Investigation was completed and the final report submitted to the COGCC on December 31, 2007. The Phase II report is available on the COGCC website library (www.cogcc.state.co.us). During the investigation 3,287 miles of county roads, lease roads and jeep trails were surveyed for seeps, detailed mapping was conducted at 55 sites, gas samples were collected from 32 gas seeps and water samples were collected from 17 domestic water wells. Fifty nine seeps were identified during the investigation. Most of these are in Las Animas County; however, eleven seeps were identified in Huerfano County. The scope of work was expanded to assist in the investigation of methane impacted water wells in Huerfano County. The results of the water quality sampling were submitted to the water well owners.

Orphaned Wells and Sites

Approximately \$2,262 was spent on orphaned well site in Cheyenne County FY 2007-2008 to re-set top plugs and to cut off and cap the surface casing. The location was re-contoured to the specification of the landowner and will be incorporated into his farming operations.

APPENDIX 1

COGCC COMMISSIONER BIOGRAPHIES

**BIOGRAPHICAL SKETCHES OF
COLORADO OIL & GAS CONSERVATION COMMISSIONERS
as of 8/8/07**

Richard D. Alward is an ecologist and environmental scientist based out of Grand Junction. He earned his Ph.D. in Ecology from Colorado State University (1999) and both an M.S. (1992) and B.S. (1984) in Biology from the University of Nebraska. Mr. Alward has performed research projects on wildlife habitat management, climate change, grazing, weed control, vegetation monitoring, and native species restoration in Colorado, Utah, Nebraska, South Dakota, Swaziland (while a Peace Corps Volunteer) and Antarctica. He is a member of the Ecological Society of American and the Society for Conservation Biology. His current consulting has him involved in a restoration project with the National Park Service and numerous biological studies that are required as part of the environmental permitting process for development projects, including energy development, throughout western Colorado.

Mark Cutright, P.E. is Operations Manager for Excell Services, Inc. a subsidiary of J-W Operating Co. He earned a B.S. in Petroleum Engineering from the Colorado School of Mines in 1980 and is a Registered Professional Engineer in Oklahoma. During his oilfield career of over 27 years, Mr. Cutright has held various engineering, operations and management positions with EnCana Oil and Gas, Grey Wolf Drilling, Exeter Drilling (an Occidental Petroleum subsidiary) and Brinkerhoff-Signal Drilling. He has extensive experience in the oil industry throughout the Rocky Mountains, California, North-Eastern U.S., Mid-Continent, South-Eastern U.S., South Texas, Ark-La-Tex and South America regions. He has served on numerous boards and committees for Petroleum and Professional Engineering related organizations. He is a member of Society of Petroleum Engineers, International Association of Drilling Contractors, American Association of Drilling Engineers, and International Society of Explosives Engineers. He also serves as a Community Advisor on the Cherry Creek Schools - Long-Range Facility Planning Committee.

Tom Compton and his wife, Penni, own and operate a beef cattle ranch near Hesperus in Southwest Colorado. He holds an M.S. degree in Biology from the University of Alaska and a Ph.D. degree in Zoology from the University of Wyoming. He has taught biology at several colleges including Wheaton College in Illinois, Letourneau University in Texas, Fort Lewis College in Durango and the University of Texas at Tyler. Compton is a past president of the Colorado Cattlemen's Association and served as the original chairman of the board of the Cattlemen's Land Trust. He is the current vice president of the Colorado Rural Electric Association. He also served on Colorado's Roadless Area Task Force.

Michael P. Dowling is a founder and the current chairman of the Colorado Conservation Trust, a former chairman of the Colorado Wildlife Federation, and a former board member of the Colorado Coalition of Land Trusts. He is also a founder and principal of Western Ranchland Investors, a conservation real estate firm that designs and implements limited development solutions for threatened agricultural and natural landscapes. Mr. Dowling has also worked as an energy and environmental consultant, as a management consultant with the international firm of McKinsey & Company, and as an entrepreneur and investment manager in the oil and gas industry. Mr. Dowling has a B.S. in Geology and Geophysics (with honors) from Yale College, a Master of Forest Science degree from the Yale School of Forestry and Environmental Studies, and a Master of Public and Private Management degree from the Yale School of Management. Michael is also an active outdoorsman, a former river guide, and a trustee of the Colorado Symphony Orchestra.

Joshua Epel provides legal counsel to DCP Midstream, LLC. The company is one of the nation's largest natural gas gatherers and processors and operates 52 plants and hundreds of other facilities. Mr. Epel has practiced environmental law for over 25 years, and specializes in air pollution law. His practice has ranged from representing public interest organizations and working for a lead planning agency, to providing legal counsel to the oil and gas, cement, titanium, CFC recycling and other manufacturing industries. Mr. Epel has also authored economic analyses of the cost effectiveness of substituting alternative fuels for conventional motor vehicle fuels for U.S. EPA, NASA and public utilities. In addition to his private sector work, Mr. Epel has served on the Public Advisory Committee of the Grand Canyon Visibility Transport Commission, the Stationary Sources Joint Forum of the Western Regional Air Partnership, and the Denver Metropolitan Regional Air Quality Council, and chaired the Mobile Sources Sub-committee. Most recently, Mr. Epel was a member of the New Mexico Climate Change Advisory Committee.

Trési B. Houpt, a Colorado native, serves as a Garfield County Commissioner. She is a former School Board Member for the Roaring Fork School District, Executive Director of Valley Resource Management and long-time member of the non-profit community. Ms. Houpt is the Chair of the Colorado Counties Inc. (CCI) Natural Resource and Land Use Steering Committee and a member of the National Association of Counties (NACO) Environment, Energy and Land Use Steering Committee. She has worked extensively with Colorado's Congressional Delegation, State Legislators, Local Officials and Industry representatives on creating and proposing laws and regulations that would bring a reasonable balance to energy development in the State of Colorado. Ms. Houpt is currently a member of the Executive Committee and Past-Chair for the I-70 Mountain Corridor Coalition, Past-President for CCI's Western District, current Board Member and Past-Chair for the Rural Resort Region, Board Member for the Rocky Mountain Rail Authority, Advisory Board Member for the Colorado Mountain College Rifle Campus, Advisory Board member for the Ruedi Water and Power Authority, served on the Advisory Board for the State Park System Strategic Planning Process and served on Governor Owens' Blue Ribbon Panel on Housing. Commissioner Houpt has a B.S. in Political Science and Sociology from Lewis and Clark College.

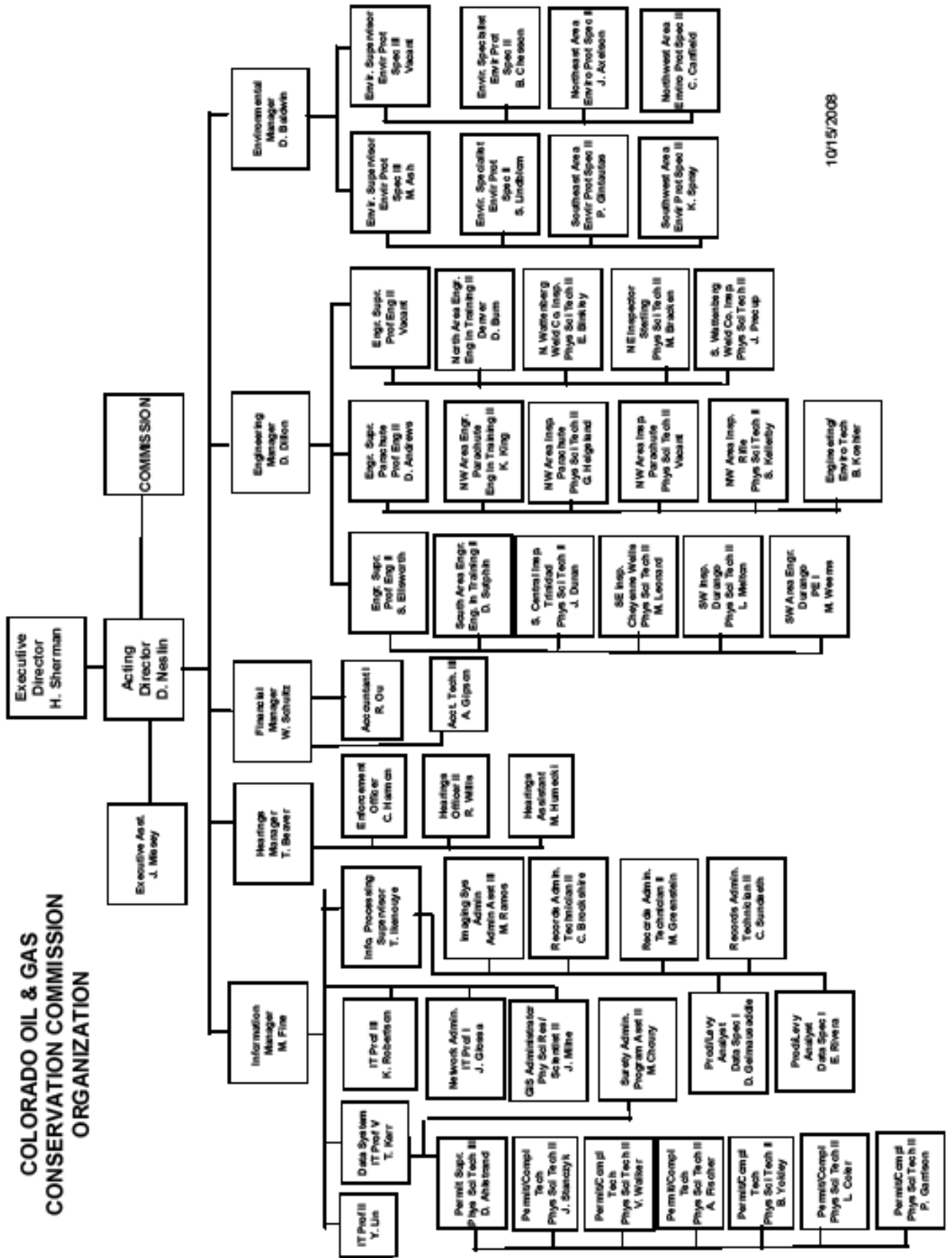
James B. Martin is the Executive Director of the Colorado Department of Public Health and Environment, responsible for broad-based health programs and a full array of environmental activities, including air and water quality protection and improvement; hazardous waste; solid waste management; radiation services; pollution prevention; consumer protection; and environmental leadership. Prior to joining the department, Mr. Martin was the Executive Director of Western Resource Advocates, a Boulder-based environmental law and policy organization. Prior to that, he was Director of the Natural Resources Law Center at the University of Colorado School of Law. He also was Senior Attorney and Director of the energy program for Environmental Defense, and from 1986 to 1992 he worked for former U.S. Representative and Senator Tim Wirth, including four years as State Director and Counsel. Mr. Martin also served on the Colorado Air Quality Control Commission from February 21, 2003 to January 12, 2007. He earned his undergraduate degree in Biology from Knox College in Illinois and his law degree from Northwestern School of Law, Lewis and Clark College, in Oregon.

Harris Sherman is the Executive Director of the Colorado Department of Natural Resources, overseeing Colorado's energy, water, wildlife, parks, and state lands programs. He is a member of Governor Ritter's Cabinet and also serves as the Director of the Colorado Interbasin Compact Commission. Mr. Sherman received his B.A. degree from Colorado College and his law degree from Columbia University Law School. As Managing and Senior Partner of the Denver office of Arnold & Porter, his law practice focused on natural resources, environmental, water, public land, real estate, and Indian law. He has also served on a wide variety of public

and private agencies and organizations including Chairman of the Colorado Water Quality Control Commission; Chair of the Colorado Mined Land Reclamation Board; Chair of the Denver Regional Air Quality Council; Commissioner of Mines; Commissioner of the Denver Water Board; Trustee of the Boettcher Foundation; and Trustee of Colorado College. For several decades, he has been active in land conservation efforts with the Nature Conservancy, Colorado Open Lands, and the Trust for Public Land. As a lifelong Colorado resident, Mr. Sherman is an avid hiker, skier, and cyclist, spending much of his free time at his ranch in Summit County.

APPENDIX 2
COGCC ORGANIZATION CHART

**COLORADO OIL & GAS
CONSERVATION COMMISSION
ORGANIZATION**



10/15/2008

APPENDIX 3

GEOGRAPHIC AREAS OF TECHNICAL RESPONSIBILITIES

