

# Environmental impacts

## Water Quality and availability

The HDs function as the watershed for the Bayfield area. These mountains filter and store this precious resource, while feeding the many springs found in and around the range. Community members depend on this pristine watershed for clean water for themselves, livestock, agricultural uses, and wildlife. The gas industry's documentation states that springs in the area where wells are drilled can be expected to dry up. The Bureau of Land Management estimates that a single well can lower aquifer levels by 34 feet within ten feet of the well. The cumulative lowering of water levels is unknown, but coal mining studies suggest that it could take over 1000 years for aquifers to recharge. Especially in our current drought situation, the drying up of wells, seeps, sub-irrigated fields and natural springs that originate in the HDs will mean increased physical and economic hardship for those that depend upon them.

During drilling of CBM wells, aquifers are breached and cross-contamination can occur if wells are not cased or the casings fail. Drilling fluids, also known as "mud", hydraulic fracturing fluids and other industrial wastes are often stored in unlined pits that can allow infiltration of contaminants directly to groundwater.

Often wells require water removal to release the gas from the coal. The average amount of water released in the San Juan Basin as a whole is 25 barrels per day, at a ratio of 0.013 gallons of water per day every thousand cubic feet of gas produced. One barrel equals 42 gallons, so the average well in the San Juan Basin produces 1,050 gallons of water each day. For the 4,208 coalbed methane wells in the San Juan Basin, this adds up to 4.42 million gallons of water produced from the Fruitland Formation Coal in the San Juan Basin *every day*, equal to 13.6 acre-feet of water per day. This produced water is in many cases as salty as the ocean, and therefore disposal of this water can be problematic.

Four methods of handling produced water are typically used today, each with its own set of problems. Produced water often leaks from **storage tanks**, permanently impacting the surrounding soil, rendering it barren of vegetation. **Reinjection** of produced water can introduce saline water into deeper aquifers that may contain fresh water, and may cause unseen problems at the surface miles away from the actual injection point. **Surface impoundments** require digging up even a larger area of ground than that was required by the well pad, and depending on water quality these ponds must be lined, so disposal happens only by evaporation, and the water in the ponds gets successfully more saline as evaporation proceeds. Wildlife or livestock drinking this water can become sick or die from this water, and breaches and leaks occur effecting both surface and groundwater supplies. **Discharging** water onto the ground surface causes problems with erosion of stream channels, flooding of low lying areas, and other downstream effects. In La Plata County, more than 90 percent of produced water from oil and gas production is disposed of by underground injection.

## **Air Quality**

Ground level ozone is formed from two byproducts of the oil and gas industry, VOC's (Volatile Organic Compounds), and  $\text{No}_x$  (Nitrogen Oxides). The reaction is stimulated by ultraviolet radiation and heat, so warm summer months increase ground level ozone. This harmful reaction has resulted in the recent elevated levels of ozone in the Four Corner's Region. The Farmington area is four points away from reaching the EPA's unacceptable limit for ozone. Ozone can irritate respiratory systems, reduce lung function, aggravate asthma and damage cells lining lungs. Children are more vulnerable to air pollution because they breathe more air per pound of body weight. Active adults of all ages who breathe harder are also more vulnerable.

Higher levels of particulate matter are released when increased road building and well pad construction strips off protective topsoil, leaving bare dirt exposed to wind. Vehicle traffic on the roads in the historically dry Southwest contributes further to particulate emissions. Emissions from vehicles also affect the air quality surrounding CBM developments. The combined effects of these emissions can affect the local and regional air quality and visibility, and may impact nearby areas that have protected airsheds, such as the Weminuche Wilderness Area and Mesa Verde National Park.

## **Underground Fires and Methane Seepage**

The coal-bearing Fruitland Formation is the target for methane gas drillers. This geologic formation is warped upward by the San Juan Mountains and outcrops at the surface along the northern edge of the San Juan Basin, roughly parallel with Highway 160. Past experience has shown that drilling near the outcrop causes catastrophic consequences — underground coal fires, methane seeps that kill large swaths of vegetation, and uncontrolled venting of methane to the surface and into domestic water wells. The most dramatic occurrence resulted in the demolition of four homes along the Pine River north of Bayfield because of hazardous levels of methane contamination.

As a result, state and federal rules presently prohibit any new wells within 1.5 miles of the Fruitland Formation outcrop. By retaining this existing 1.5-mile buffer from the Fruitland outcrop as a health and safety measure, the Forest Service would reduce the number of proposed new wells by only 15-20% and thereby maintain a safeguard for public health and safety.

## **Erosion and weeds**

By scraping bare 1,000 or more acres and building more than 60 miles of new roads, erosion and weeds will increase. Already, roads, gas pads, and pipelines are eroding at an alarming rate in the San Juan Basin. Historically, reclamation of existing and abandoned wells has been less than effective in controlling erosion and the spread of noxious weeds. These impacts could be minimized by reducing the miles of roads, reclaiming the abandoned gas pads and pipelines, and reducing new impacts by requiring the use of existing gas pads for multiple directionally drilled wells.

## **Noise and Property values**

CBM wells drilled on or adjacent to private land can reduce property values and render land difficult to sell. A recent survey performed for La Plata County documented a 22% decline in residential property values associated with nearby gas wells. Coalbed methane development can turn once rural areas into industrial zones. Noise from associated equipment can heavily impact the residents and wildlife of the area. This noise comes initially from the heavy equipment used to create roads with drill pads, continues at very high levels during drilling and well completion, and becomes a permanent part of the landscape with the installation of pipelines, compressors, pumpjacks, and with the large amount of vehicle traffic needed for routine maintenance.