

NEW MEXICO ACID GAS INJECTION PRIMER

WHAT IS ACID GAS INJECTION (AGI)?

AGI is the process of compressing and permanently disposing of naturally-occurring carbon dioxide (CO₂) and hydrogen sulfide (H₂S) which often come out of the ground mixed with oil and natural gas. Natural gas that contains these compounds is commonly called "sour gas". These waste gases are removed from the sour gas at a gas processing plant before purified gas is sent to market. This waste stream is then compressed to a dense (liquid) phase and injected into a closed-system geologic reservoir which has been permitted for permanent acid gas waste disposal. Acid gas injection, in effect, returns natural waste gases to the subsurface where they have existed for millions of years and sequesters them in reservoirs capable of permanently containing them. These reservoirs are commonly located miles below any sources of groundwater or drinking water and are isolated from groundwater and drinking water by multiple strings of casing and cement in specially-constructed wells.

WHY IS IT NEEDED IN NEW MEXICO?

Many of the oil producing reservoirs in NM produce sour oil and gas, meaning oil and gas which contain elevated levels of H₂S, other sulfur compounds and CO₂. H₂S is a poisonous gas which cannot be released to the environment without treatment or flaring (burning). Flaring, however, causes unacceptable air quality impacts and therefore is not permitted. CO₂ is allowed to be discharged directly into the atmosphere, but this practice is not environmentally-friendly because CO₂ is a greenhouse gas that is associated with global warming. Unfortunately, the production of sour gas is not something that can be avoided in NM because it is impossible to produce NM's oil and gas (especially in the Permian Basin) without producing these undesired by-products that need to be treated and dealt with in a manner that protects the environment and promotes public health.

ECONOMIC BENEFITS OF AGI?

AGI provides oil and gas producers with a permanent disposal option for sour oil and gas that is not only commercially viable but more importantly an established practice that allows producers to safely dispose of H₂S and CO₂ in an environmentally-friendly manner. Without the ability to treat sour gas and appropriately and safely dispose of the resulting waste, NM would see a significant impact to its budget as a result of dramatically lower oil and gas production and associated royalty and tax revenues.

ENVIRONMENTAL BENEFITS OF AGI?

AGI minimizes the need to handle sour gas at the surface and provides a permanent, safe disposal of CO₂ and H₂S which eliminates the global warming potential of the CO₂ and the health risks associated with H₂S. AGI reduces the overall public health risks associated with oil and gas production and processing by reducing carbon footprints and minimizing the required handling of H₂S at the surface.

ARE THERE ANY PUBLIC HEALTH RISKS ASSOCIATED WITH AGI?

In contrast to other methods of treating naturally-occurring H₂S associated with sour oil and gas, AGI facilities minimize the surface handling of H₂S when compared to other systems that require chemical

treatment of the H₂S and CO₂ stream (such as Sulfur Reduction Units– SRUs, field treating with catalysts and flaring). Further, the current permitting requirements for AGIs consistently assure AIG operations are constructed and operated in a manner that is safe, reliable and environmentally-friendly.

WHAT ARE THE ALTERNATIVES TO AGI?

Processing sour oil and gas requires H₂S and CO₂ be separated from the hydrocarbon products that result from the process of creating fuels and other hydrocarbon products. Alternative treatments include both catalytic destruction of the H₂S and discharge of the CO₂, SO₂ and other minor residual products to the atmosphere. This is often accomplished in a Claus unit or SRU which converts H₂S to native Sulfur (which then must be disposed of as a hazardous solid waste) and releases large amounts of CO₂ as well as some water and permissible amounts of SO₂ to the atmosphere. In addition to increasing the public health risk associated with processing of natural gas and oil, these alternative methods do nothing to reduce the emission of greenhouse gases that are an unavoidable consequence of alternatives to AIG. Simply put, AGI is the current industry Best Available Control Technology (BACT) for dealing with the H₂S and CO₂ that results from processing and refining oil and gas.

HOW MANY AGI FACILITIES/WELLS ARE CURRENTLY OPERATING IN NM?

There are currently fifteen AGI wells in NM (14 in SENM and 1 in NWNM) that have been permitted and are operational. The oldest has been operating as an AGI well since about 1995. Most of the wells have been installed and have operated successfully since the early 2000s. Without these wells and the associated gas processing facilities, NM sour oil and gas production could not continue because operators cannot produce oil without doing something to handle the associated sour gas.

WHAT IS THE SAFETY RECORD OF AGI FACILITIES AND AGI WELLS IN NM?

Not a single well has allowed the escape of acid gas to any groundwater zone or any adjacent producing zone and there has not been even one reported case of treated acid gas (TAG) escaping from a well to adjacent formations or the surface. While there have been several equipment failures within AGI wells that have resulted in wells needing to be repaired or replaced, no environmental incidents or any injuries or health effects have resulted from AGI facility and well operations. AGI operations have and continue to be safely conducted and carefully monitored by the NMOCD to assure that said wells and facilities continue to operate in a safe and environmentally-secure manner. The monitoring and reporting requirements have evolved with the evolving state of the industry and the experience of regulators.