



Cricket Valley | Aqueous Ammonia

Cricket Valley Energy Center (CVEC), a fully permitted facility now under construction in Dover, NY, will be among the most efficient and lowest emitting power plants of its kind ever constructed, producing power for nearly one million homes and economic benefits for the community.

Q. What is ammonia?

A: Ammonia, also known as NH₃, is a colorless liquid or gas commonly found in water, soil and air. A vital source of nitrogen for plants, animals and humans, ammonia is one of the most commonly produced industrial chemicals in the United States and exists naturally in humans and the environment.

Most ammonia in the environment comes from the natural breakdown of manure and decaying plants and animals.

Ammonia is typically supplied in two different ways: commercial grade anhydrous ammonia or aqueous ammonia.

Anhydrous ammonia is significantly less expensive, however aqueous ammonia, a solution of ammonia and water, is safer to transport, store and handle.

Q. How is ammonia used?

A: Ammonia is most commonly used in agriculture as a fertilizer. It can also be used as a refrigerant gas, a water purifier and in the manufacturing of plastics and textiles. It is also used as an ingredient in household cleaning supplies, and in industrial use.

Q. Will Cricket Valley Energy Center use ammonia?

A: Cricket Valley Energy Center (CVEC) will use aqueous ammonia to reduce Nitrogen Oxide emissions that are formed when atmospheric nitrogen is oxidized at high temperatures.

The concentration of ammonia in the solution used at CVEC will be well below that found in most industrial uses. While ammonia solutions for industrial uses generally range from a concentration of 25% or higher, the ammonia used for CVEC will be stored and utilized at a 19% concentration.

CVEC will use aqueous ammonia, which is safer to transport, poses fewer health hazards and, in the case of an incident, affects a smaller area than anhydrous ammonia. The table below explains the difference between anhydrous and aqueous ammonia.

Anhydrous Ammonia v. Aqueous Ammonia

	Anhydrous Ammonia	Aqueous Ammonia
State of matter	Gas	Liquid (81% water; 19% ammonia)
Risks of accidental exposure	Potential for severe inhalation risks upon exposure	Potential for hazard to skin from contact to corrosive liquid
Area of influence in hazard situation	Accident has a higher area of influence (e.g. area evacuations necessary)	Accident has a lower area of influence (e.g. clean-up at site of spill)
Regulations on concentration	All concentrations subject to strict DOT and Department of Homeland Security regulations	High concentrations subject to regulations; all concentrations may be subject to local regulations
Risks during transport	Hazardous to transport	Transporting is safer
Energy costs	Low energy requirements result in lower energy costs	More expensive to vaporize due to energy costs required to evaporate water content
Safety liability	High liability; requires extensive safety training	Lower liability; requires more moderate safety training

References: National Library of Medicine and WAHLCO

Q. How will the ammonia solution be stored on site?

A: The aqueous ammonia solution used at CVEC will be contained in a storage area with two levels of safety, providing safeguards consistent with New York State requirements.

One 30,000-gallon aqueous ammonia storage tank will be located on site and double-walled to provide an additional layer of safety.

CVEC employees are highly trained in the proper storage, transfer, and handling of aqueous ammonia and follow all State and local regulations, including Occupational Safety and Health Administration (OSHA) regulations. CVEC is also developing detailed procedures for the safe offloading of ammonia based on industry best practices.

Q. How will ammonia be delivered to the site? How often?

A: The ammonia will be delivered by specialized tanker trucks that have been approved by the United States Department of Transportation (USDOT) specifically for transporting these materials. It is anticipated that there will be 15 truck deliveries per month.

Q. What precautions have been taken by Cricket Valley Energy Center in case of a hazard situation?

A: CVEC places the safety of the community and its workers first. That's why all workers complete extensive safety training prior to coming on site to work at the Facility, and why teams are prepared with worst-case safety and communication plans.

In addition to using a solution with a concentration of ammonia 6% below that commonly used for similar projects and additional safety precautions for aqueous ammonia storage, CVEC has taken the following safety precautions related to the use of ammonia:

1. CVEC follows all regulations of ammonia as specified by the United States Environmental Protection Agency (USEPA) and the New York State Department of Environmental Conservation (NYSDEC).
2. CVEC employees are highly trained in the storage, transfer and handling of aqueous ammonia, and follow all regulations, including OSHA 29 CFR 1910.2000, which applies to aqueous ammonia. They will also be equipped and trained in detailed procedures and checklists for safe off-loading of ammonia based on industry best practices.
3. CVEC is working with local fire and emergency service providers on safety and site familiarization, with plans for annual drills and training.
4. The USEPA conducted an "Accidental Consequence Analysis" to examine a hypothetical worst-case spill scenario. It determined that if this were to happen, there would be no appreciable risk to anyone or anything outside the CVEC property boundary.
5. The double-walled storage tanks are equipped with multiple ammonia detectors which provide an early detection system, enabling CVEC to address concerns before they become problems.

For more information:

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