

# Exhibit 4 DEC Aqua Ammonia Supply

IFB 6701



## City Council Presentation

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# Presentation Overview:

- ▶ What is Ammonia
- ▶ What is the function of Aqua Ammonia at DEC
- ▶ Storage and Handling of Aqua Ammonia
- ▶ Emergency Response
- ▶ Bid Summary
- ▶ Questions



# Ammonia ( $\text{NH}_3$ ):

## ▶ Chemical Properties

- ▶ A colorless gas with a characteristic pungent smell. It is a naturally occurring compound that is present in nature and the human body
- ▶ Readily dissolves in water
- ▶ Anhydrous Ammonia is 99% ammonia
- ▶ Aqueous Ammonia is a solution of water and ammonia (19%)

## ▶ Industrial and Household uses

- ▶ Anhydrous Ammonia is used worldwide as a agriculture fertilizer
- ▶ Ammonia Solutions (5%-10%) are used in household and industrial cleaners
- ▶ Aqueous Ammonia and Urea (40%) are widely used as reducing agents in Selective Catalytic Reduction Systems

# Aqueous Ammonia(AA) in SCR:

- ▶ SCR systems use a chemical reaction to reduce in part Nitrogen Oxides (NOx) produced by combustion engines
- ▶ The three main components of system are catalyst, reducing agent and heat
- ▶ The AA is introduced into the exhaust stream where it is mixed and heated prior to entering the catalyst housing
- ▶ The chemical interaction of the three main components effectively reduces NOx down to nitrogen and water
- ▶ The DEC SCR system utilizes AA as the reducing agent
- ▶ AA will be consumed at a rate of between 18.5 and 14.5 gallons per engine hour
- ▶ An automated system will ensure that the AA is dosed properly

# Aqua Ammonia Storage and Handling:



# AA Storage and Handling:

- ▶ Plant's AA storage capacity is 30,000 gallons (172 plant hours)
- ▶ The AA will be stored in a tank designed to store ammonia
- ▶ The AA will be delivered via tanker (frequency depends on plant operations)
- ▶ The Plant has offloading facilities to properly transfer AA from tanker to Tank



# Emergency Response Plan:

- ▶ Plant's Emergency Response Plan addresses AA Spill Prevention and Containment Countermeasures
- ▶ The AA storage tank concrete containment dike has sufficient capacity to contain all tank contents
- ▶ The Plant has a tanker offloading area designed to contain any discharges that might take place during transfer
- ▶ Emergency Response will be provided by DFD with back up by environmental contractor if warranted
- ▶ Any non-contained discharges greater than 25 gallons would be reported to TCEQ

## Summary of Bids:

- ▶ Purchasing method used was Invitation For Bid
- ▶ 3 year supply of AA
- ▶ 2 bids were received
- ▶ The bids where \$0.6455 and \$0.7371 per gallon
- ▶ Staff recommends awarding the lowest cost bid submitted by Southern Ionics, Inc., in an amount not to exceed \$1,287,772.50
- ▶ Plant's chemical budget will cover AA expense



# Questions:



**Chris Lutrick & Brent Heath**