
MEMORANDUM

TO: MIKE SCHNEIDER
FROM: ENSAFE INC.
SUBJECT: EMISSIONS FROM LIQUID FERTILIZER TANKS
DATE: 6/2/05
CC: HELENA CHEMICAL COMPANY

A request was made by NMED to evaluate the potential for emissions of air toxics from the liquid fertilizer tanks at Helena's plant in Mesquite, NM. EnSafe has reviewed numerous sources of information and documents and has prepared the following summary of our findings.

The following are some of the liquid fertilizers that contain ammonia salts:

- 32-00-00 Liquid Fertilizer – 45% Ammonia Nitrate
- 10-34-00 Liquid Fertilizer – 10% Ammoniacal Nitrogen
- CAN 17% - Ammonia Nitrate (wt% not provided)

EnSafe reviewed the following documents while researching this issue:

- Product Material Safety Data Sheets
- EPA Emission Factor documents including:
 - Air CHIEF,
 - FIRE,
 - AP-42,
 - Tanks 4.9 Reference Material,
 - TRI Guidance Documents,
 - EIIP Preferred and Alternative for Estimating Air Emissions, and
 - Various articles and fact sheets found searching the internet

Conclusions

The following are pertinent facts used to make the conclusion below:

1. The only “air toxic” that is reasonably anticipated to be emitted from the liquid fertilizer tanks is ammonia. Such emissions could theoretically result from volatilization of ammonia generated as a result of dissociation from ammonium salts present in the fertilizer formulations.
2. Ammonium salts (ammonia nitrate, ammonia sulfate, etc...) are solids under normal conditions. These salts are dissolved into a solvent, typically water, to form a liquid ammonium salt solution. According to the information reviewed, these materials are completely soluble in water and are stable under normal conditions.
3. These liquid fertilizers are solutions of inorganic salts, and therefore neither Tanks 4.9 nor its equivalent AP-42 document is an applicable method for estimating emissions.
4. Ammonium salts are very stable and do not dissociate under normal temperature and pressures. Our research indicates that these compounds do not begin to dissociate until the temperature reaches 210 °F. Another method to dissociate these materials is through chemical reaction with acids or bases. The liquid fertilizers at the Helena plant are stored under ambient conditions and do not undergo any chemical reactions.
5. A review of the AP-42 guidance documents and corresponding background documents for the production of ammonia nitrate and ammonia sulfate, indicate that emissions from liquid solutions occur only during neutralization and concentration (i.e. evolution of ammonia only occurs during chemical reactions or heating).
6. A review of the Emergency Planning and Community Right-to-Know Section 313 Guidance for reporting Aqueous Ammonia was also completed. There is no reference to air emissions from storage, use, or transfer of ammonium salts in this document.

Based on the information presented above, and the fact that liquid fertilizers at the plant are not heated nor reacted, ammonia or ammonia salt emissions from the fertilizer storage tanks at Helena’s Mesquite plant – although not practically quantifiable - are expected to be negligible.