MARY KAY O'CONNOR PROCESS SAFETY CENTER
TEXAS A&M ENGINEERING EXPERIMENT STATION

Submitted to the

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

Testimony of

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On

Oversight of Federal Risk Management and Emergency Planning Programs to Prevent and Address Chemical Threats, Including the Events Leading Up to the Explosions in West, TX and Geismar, LA

Thursday, June 27, 2013

Introduction

My name is M. Sam Mannan and I hold a BS, MS, and PhD in chemical engineering. I am a registered professional engineer in the states of Louisiana and Texas, and I am a certified safety professional. I am a Fellow of the American Institute of Chemical Engineers and a member of the American Society of Safety Engineers, the International Institute of Ammonia Refrigeration, and the National Fire Protection Association. I am Director of the Mary Kay O'Connor Process Safety Center, holder of the T. Michael O'Connor Chair I in Chemical Engineering, and Regents Professor of Chemical Engineering at Texas A&M University. The Center was established to memorialize Mary Kay O'Connor, a chemical engineer who, along with 22 others, died in a chemical plant explosion in 1989 in Houston, Texas. The Center mission is to lead the integration of process safety – through education, research, and service – into the education and practice of all individuals and organizations involved in chemical operations. The vision of the Center is to serve as the premier process safety resource for all stakeholders so that safety becomes second nature for managers, engineers, and workers as progress continues toward zero injuries and lost lives. The Center seeks to develop safer processes, equipment, procedures, and management strategies that will minimize losses in the process industry. My area of expertise within the chemical engineering discipline is process safety. I teach process safety engineering both at the undergraduate and graduate level. I also teach continuing education courses on process safety and other specialty process safety courses in the United States and overseas. My research and practice is primarily in the area of process safety and related subjects. The opinions presented in this document represent my personal position on these issues. These opinions are based on my education, experience, research and training.

Risk management and emergency planning programs to prevent and address chemical threats are of extreme importance for the protection of the workforce, public, and the environment. These programs are also of great importance for the US national economy and security. I applaud the US Congress for continuing to pay attention to such important issues, and I appreciate the opportunity to provide my opinions in this process.

Background

Chemicals play a key role in today's high-tech world. The chemical industry is linked to every technologically advanced industry. Only a handful of the goods and services we enjoy on a daily basis would exist without essential chemical products. Chemicals are also a big part of the economy in Texas and many other states. For example, the Texas chemical industry alone provides more than 100,000 jobs, and the state's chemical products are shipped worldwide at a value of more than $20 billion dollars annually.

But the use of chemicals is a two-edged sword. Safe use creates a healthier economy and a higher standard of living. Unsafe use threatens our lives, our businesses and our environment. As the industry's sophistication increases, so does the need to work and live safely with chemicals. In order to accomplish this, many stakeholders must work together diligently and

with persistent determination. A common theme that also must be present is competence at all levels with regard to knowledge and execution of responsibilities.

Today's hearings are an appropriate congressional response to the recent events in West, Texas, and Geismar, Louisiana. Both these events were tragic and our heart goes out to the affected people, neighborhoods and cities, and the local authorities. We must as a nation and individuals explore and investigate these incidents and do our best to prevent the recurrence of such incidents. The hearings are focused on federal oversight programs, and I will limit majority of my testimony to that topic. However, because of the nature of accident prevention and role of all stakeholders, I will at times touch on those issues as well. Also, at the Center we had one PhD researcher working on ammonium nitrate before the West, Texas incident happened, and since the West, Texas incident, we have had a team of five PhD researchers working under my guidance on researching this whole issue and associated topics. Therefore, much of my testimony and opinions are derived from looking at the aftermath of the West incident. Wherever possible, I have tried to include information and knowledge derived from the Geismar, Louisiana, incident and its aftermath. I must also state that much is still unknown about these incidents and as the root causes are identified and more definitive information becomes available, some of these conclusions and opinions may have to be revisited.

The West, Texas, Incident

On Wednesday, April 18, 2013, an initial fire exacerbated into an explosion at West Fertilizer in West, Texas, causing the death of 15 people and injuring more than 200. The blast wave completely destroyed the facility and also caused varying levels of damage to many buildings, businesses, and homes at significantly long distances from the plant. More than 50 homes, a 50-unit apartment building, a nursing home and four schools were in the impact zone. Of the 15 people who died, 12 were emergency responders, who were responding to the initial fire and trying to control and extinguish the fire when the catastrophic explosion occurred.

The Geismar, Louisiana, Incident

On Thursday, June 13, 2013, an explosion occurred at Williams Olefins in Geismar, Louisiana, causing the death of two people and injuring more than 70.[1] Residents from a nearby community (St. Gabriel) were instructed to shelter in place.[2] This facility handles toxic chemicals and there was a concern about the air quality; therefore, the Louisiana Department of Environmental Quality (DEQ) checked the air quality during the subsequent days.[3] On the same day of the incident, the National Oceanic and Atmospheric Administration's (NOAA) Scientific Support Coordinator (SSC) was contacted by the US Coast Guard (USCG) regarding the plant fire and explosion at the Williams facility. Currently the USCG is requesting weather and plume modeling from NOAA.[4] An official report of total damages caused by the explosion is not available yet.

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[1] http://co.williams.com/williams/news-media/geismar-update/
[2] http://www.nola.com/traffic/baton-rouge/index.ssf/2013/06/explosion_at_williams_olefins.html
[3] http://www.deq.louisiana.gov/portal/WilliamsOlefins.aspx
[4] Emergency Response Division, Office of Response and Restoration,
National Ocean Service, National Oceanic and Atmospheric Administration, US Department of Commerce.
http://incidentnews.noaa.gov/incident/8613

Federal Oversight Programs for Risk Management and Emergency Planning and Lessons Learned from West, Texas, Incident

The West Fertilizer facility had a capacity to store 110,000 lbs of ammonia and 540,000 lbs of ammonium nitrate (Tier II reporting data from 2012). The discussion below provides a summary of different federal regulations the West facility was required to comply with and the known status of such compliance and the oversight role played by the respective federal agencies.

OSHA Regulations

The Occupational Safety and Health Administration (OSHA) has general and specific regulations that would apply to the use and possession of Ammonium Nitrate (AN). Appendix A provides a more detailed discussion on potential coverage/oversight of the West Fertilizer facility by OSHA regulations and the regulatory requirements.

The West facility was required to comply with specific OSHA regulations, including the *Hazard Communication Standard* (29 CFR 1910.1200) and *Explosives and Blasting Agents Standard* (29 CFR 1910.109). While it is not clear what the compliance status of the facility was at the time of the incident, it can be argued that compliance with these programs could have prevented or mitigated the incident.

Compliance with the *Explosives and Blasting Agents Standard* also has many measures that would have prevented or mitigated the incident. For example, the ammonium nitrate was stored in a warehouse, in very close proximity to the seed area. "Ammonium nitrate shall be in a separate building or shall be separated by approved type firewalls of not less than 1 hour fire-resistance rating from storage of organic..."[5] Seed is an organic and combustible material, which could propagate the fire to areas where ammonium nitrate was stored. Storage of ammonium nitrate at an adequate distance from the seed area might have helped in preventing the explosion. It is unknown – but unlikely – whether the warehouse had firewalls. Firewalls would have prevented ammonium nitrate from heating and reaching the onset temperature of decomposition. The warehouse construction material was wood, which is also a combustible material. Overall, from what is known, the storage of ammonium nitrate at West Fertilizer Company did not provide adequate measures to prevent overheating and propagation of fire, which eventually lead to the explosion. "Not more than 2,500 tons (2270 tonnes) of bagged ammonium nitrate shall be stored in a building or structure not equipped with an automatic sprinkler system."[6]

Proper training on the hazards of ammonium nitrate and knowledge about a potential violent decomposition might have allowed firefighters to take a different approach when responding to and fighting the initial fire.

[5] 29 CFR 1910.109(i))
[6] Id.

General requirements include the "*General Duty Clause*" of the Occupational Safety and Health Act (P.L. 91-596, as amended) and an Emergency Action Plan (EAP) according to OSHA Standard 1910.38[7]. The "*General Duty Clause*" requires employers to provide employees with a workplace that is free from *"recognized hazards that are causing or are likely to cause death or serious physical harm"*[8].

The Risk Management Plan submitted by West Fertilizer Company to the US Environmental Protection Agency states that the company had an EAP[9]. However, the EAP is not publicly available.

The West facility was not covered by the Process Safety Management (PSM) standard (29 CFR 1910.119) even though it stored large quantities of anhydrous ammonia (a listed chemical under the PSM standard). OSHA proposed to exclude retail facilities, oil and gas well drilling and servicing operations and normally unmanned remote facilities from the [PSM] standard.[10] A brief summary of the PSM standard is provided in Appendix A. It should be noted that hazard analyses done under the PSM standard would have likely suggested prevention and mitigation measures similar to those provided under OSHA 1910.109 and NFPA 400.

The most recent known OSHA inspection of the West site was conducted in 1985. A fine of $30 was levied attributed to inadequate anhydrous ammonia storage and failures in Personal Protective Equipment (PPE).

EPA Regulations

Similar to OSHA, EPA also has a general duty clause and specific regulations that apply to the West Fertilizer facility. Appendix B provides a more detailed discussion on potential coverage/oversight of West Fertilizer by EPA regulations and the regulatory requirements.

Under the Clean Air Act Section 112(r)(1), the *General Duty Clause* states: *"The owners and operators of stationary sources producing, processing, handling or storing such substances [i.e., a chemical in 40 CFR 68 or any other extremely hazardous substance] have a general duty [in the same manner and to the same extent as the general duty clause in the Occupational Safety and Health Act (OSHA)] to identify hazards which may result from (such) releases using appropriate hazard assessment techniques, to design and maintain a safe facility taking such steps as are necessary to prevent releases, and to minimize the consequences of accidental releases which do occur."*

The *General Duty Clause* applies to any stationary source producing, processing, handling, or storing regulated substances or other extremely hazardous substances. "Other extremely

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[7] Shea, D.A., Schierow, L.J., Szymendera, S. (2013) Congressional Research Service. *Regulation of Fertilizers: Ammonium Nitrate and Anhydrous Ammonia.*

[8] 29 U.S.C. §654(a). http://www.gpo.gov/fdsys/pkg/USCODE-2010-title29/pdf/USCODE-2010-title29-chap15-sec654.pdf

[9] West Fertilizer Company Risk Management Plan, http://www.rtknet.org/db/rmp/rmp.php?facility_id=100000135597&datype=T&reptype=f&detail=4&submit=GO

[10] *Fed. Reg. 6355, 6363 (Feb. 24, 1992)*

hazardous substances" are any chemicals listed in 40 CFR 68, or any other chemicals, which may be considered extremely hazardous. Thus, it would seem the EPA has wide-ranging authority under the *General Duty Clause* to regulate West Fertilizer or other such facilities.

In addition to the EPA *General Duty Clause*, the following specific EPA regulations also apply to West Fertilizer:

- EPA's Risk Management Program (RMP) Rule (40 CFR 68) is intended to prevent and mitigate accidental releases of listed toxic and flammable substances. Requirements under the RMP rule include development of a hazard assessment, a prevention program, and an emergency response program. West Fertilizer would be regulated under the Program 2 requirements of the RMP rule because of the storage quantities of ammonia. Ammonium nitrate in not a listed substance under this rule.

- A separate EPA program, known as Tier II, requires reporting of hazardous chemicals (ammonium nitrate is included) stored above certain quantities. Tier II reports are submitted to local fire departments and emergency planning and response groups to help them plan for and respond to chemical disasters. In Texas, the reports are collected by the Department of State Health Services. As mentioned earlier, 2012 Tier II reporting data indicate that West Fertilizer filed a Tier II report stating that it had a capacity to store 540,000 lbs of ammonium nitrate at the facility.[11]

It could be argued that if the West Fertilizer facility had been regulated under Section 311 and 312 of EPCRA, the employees, fire responders and the community would have been more aware of the hazards of ammonium nitrate and consequences thereof. However, that argument is contingent on other factors including the fact that there is an operational and effective local emergency planning committee (LEPC) and other federal, state, and local government coordination.

The West Fertilizer facility last submitted a Risk Management Plan under the EPA Risk Management rule in June 30, 2011. In 2006, the EPA fined West Fertilizer Company with $2,300 for not having a risk-management plan that was up to federal standards. [12] [13]

DHS Regulations

Within DHS, two regulations apply to the West Fertilizer facility. Appendix C provides a more detailed discussion on potential coverage/oversight of West Fertilizer by DHS regulations and the regulatory requirements.

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[11] http://www.chicagotribune.com/news/sns-rt-us-usa-explosion-regulationbre93k09h-20130421,0,7972342.story?page=2

[12] http://www.wfaa.com/news/texas-news/Documents-show-West--203543061.html
http://www.washingtonpost.com/blogs/wonkblog/wp/2013/04/18/the-texas-fertilizer-plant-explosion-is-horrific-but-how-common-is-this/

[13] http://keranews.org/post/epa-fined-west-fertilizer-plant-2006

One of the DHS regulations that may have applied to West Fertilizer has not been finalized yet and comes under the congressional statute, ***Section 563, Subtitle J, Secure Handling of Ammonium Nitrate Public Law 110-161***. As implied, this regulation primarily deals with the control of purchase and sales of ammonium nitrate. The other DHS regulation that applies to West Fertilizer is the Chemical Facility Anti-Terrorism Standard (CFATS).

It has been widely reported that West Fertilizer did not file a Top Screen report with DHS as required under the CFATS regulation. The facility was not inspected by DHS for compliance with the CFATS requirements, given its anticipated tier that may not have happened as of today.

DOT Regulations

West Fertilizer was covered by DOT regulations. Please see Appendix D for more details on the regulatory requirements for DOT.

All DOT requirements for ammonium nitrate are with regard to safe transportation. The last known inspection of the West Fertilizer site was conducted by DOT on September 23, 2011. The inspection resulted in a fine of $5,250 with a total of 2 violations; illegible data on ASME placards and/or missing flammable gas placards (front and/or rear) and no security plan.[14] [15] [16] All the penalties/fines were with regard to anhydrous ammonia.

ATF Regulations

Appendix E provides a more detailed description of the ATF regulatory requirements pertaining to ammonium nitrate. In summary, ATF regulations do not apply to ammonium nitrate used as fertilizer. However, ATF has embarked on several collaborative programs with industry organizations to improve security and safety at all ammonium nitrate facilities.

Conclusions and Recommendations

The incidents at West, Texas, and Geismar, Louisiana, are tragedies that could and should have been avoided. However, as I have stated before, this requires continued and committed efforts by all stakeholders. We in the academic community have embarked on some ground-breaking initiatives, but I will be the first one to admit that we have not done enough and we need to do more. So, with that caveat, please understand that when I criticize other stakeholders, I am happy to take criticism myself as well.

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[14] Inspection / Investigation Report No. 1220047.
http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Press%20Releases/west_fertilizer_rpt_redact.pdf

[15] Compromise order.
http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Hazmat/Enforcement/West%20Fertilizer%20Comp%20Order%20Jun%202012.pdf

[16] Notice of Probable Violation.
http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Hazmat/Enforcement/West%20Fertilizer%20NOPV%20Jan2012.pdf

So, what should we do in the aftermath of the incidents in West, Texas, and Geismar, Louisiana? Clearly, as I have stated before, all stakeholders need to look at what they can do. However, this hearing is about the federal oversight programs on risk management and emergency planning. So, my conclusions and recommendations are primarily focused on that aspect.

1. Establishment of a national chemical incident surveillance system for process safety incidents. There is presently no reliable means for evaluating the performance of industry in limiting the number and severity of accidental chemical releases. There is also limited data with which to prioritize efforts to reduce the risks associated with such releases. Without this information, there are no means to measure the effectiveness of present programs or to guide future efforts.

2. Development of incident databases and lessons learned. This knowledge base could then be used to improve planning, response capability, and infrastructure changes. Recent experience in this regard is the improvement in planning and response for hurricane Rita from lessons learned from hurricane Katrina.

3. As a nation, we need to understand if regulations are doing what we intend them to do. To do that, we must understand the issues and to what agency to turn to find a solution. I strongly urge the US Congress to mandate a risk-based study to determine the hazards/risks and develop a regulatory map of hazardous materials oversight. This study should take into consideration types of facilities, their locations, chemicals involved and their quantities in order to determine what agencies do or do not regulate these facilities.

4. All federal agencies with responsibility to regulate safety/risk and associated issues should be required to conduct a primary screening to determine their regulatory landscape. Inter-agency training and briefings with regard to what each agency is covering and how they are enforced would also be beneficial.

5. Once the regulatory landscape is determined in item (4) above, each federal agency should be charged with developing a plan and schedule for ensuring compliance through regular inspections.

6. Inspections can only yield positive results when an adequate number of qualified, trained and competent inspectors is available. Clearly, in these days of budget restrictions, hiring and training hundreds or thousands more inspectors is going to be a challenge at least and at worst impossible. A cost-effective and viable alternative is third-party certified audits and inspections mentioned in item (7) below.

7. Congress should consider directing federal agencies to create verifiable and certified third-party auditing and inspection systems. This approach has worked for ISO-9000 certifications and other programs. There are market-based approaches through which this regime can be implemented without causing a major burden on the regulatory authority or the regulated community. For example, refer to the studies done by the University of Pennsylvania's Risk Management and Decision Processes Center regarding third-party

audits and inspections for EPA's Risk Management Program[17] and Environmental Programs[18].

8. I believe that EPCRA Sections 301-303 provide a systematic framework for coordination of hazard information, prevention programs, and emergency planning and response involving the federal government, state emergency response commissions (SERC) and the local emergency planning committees (LEPC). However, because of a lack of systematic funding and operational capability, most LEPC's are dysfunctional or exist in name only. Some further examination into better communication between the federal and state partners is needed. I urge Congress to look into ways to solve this problem and utilize the LEPC framework in an effective manner.

9. The fact that a nursing home, schools, residential neighborhoods, and other public facilities were so near the blast zone in the West Fertilizer incident raises questions about zoning and land-use planning. I urge the US Congress to look into ways to encourage states and local governments to improve and enforce risk-based zoning and land-use planning.

Summary

I applaud the US Congress for providing leadership in this important area of risk management and emergency planning programs to prevent and address chemical threats. We have made a lot of progress in moving forward to overcome the challenges we face in using chemicals to improve our lives without hurting the industry employees, the public, and the environment. We all can agree that chemicals do improve our lives but we also can agree that they can hurt us too and I as have often said, if we do not do the right things, they can make us extinct as well. This is a serious matter and I am pleased that people at the highest level of government are involved at looking at this matter.

I am encouraged by the leadership of Congress and by continued efforts to seek expertise and opinion from all stakeholders.

[17] http://opim.wharton.upenn.edu/risk/library/2001_JCB_3rdPartyAudits.pdf
[18] http://opim.wharton.upenn.edu/risk/downloads/archive/arch272.pdf

APPENDIX A
Potential Coverage/Oversight of West Fertilizer by OSHA Regulations

The Occupational Safety and Health Administration (OSHA) has general and specific regulations that would apply to the use and possession of Ammonium Nitrate (AN). General requirements include the "General Duty Clause" of the Occupational Safety and Health Act (P.L. 91-596, as amended) and an Emergency Action Plan (EAP) according to OSHA Standard 1910.38[19]. The "General Duty Clause" requires employers to provide employees with a workplace that is free from *"recognized hazards that are causing or are likely to cause death or serious physical harm"*[20]. The Emergency Action Plan must have, at minimum, the following elements[21]:

- procedures for reporting a fire or other emergency;
- procedures for evacuation;
- procedures to be followed by employees who remain to operate parts of the facilities before evacuating;
- procedures to account for all employees after evacuation;
- procedures for employees performing rescue or medical duties; and
- names and job titles of persons who may be contacted by employees to provide information to employees about the EAP

The Risk Management Plan submitted by West Fertilizer Company to the US Environmental Protection Agency states that the company had an EAP[22]. However, the EAP is not publicly available.

Other specific regulations from OSHA that might potentially cover operations at the West, Texas facility include the following:

29 CFR 1910.109: Explosives and Blasting Agents[23]

Brief summary of regulation

This standard regulates the storage, use and transportation of explosives and blasting agents, including mixtures of fuel and oxidizers, *e.g.*, mixtures that might contain ammonium nitrate. Following is the definition of a blasting agent, according to OSHA Standard 1910.109:

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[19] Shea, D.A., Schierow, L.J., Szymendera, S. (2013) Congressional Research Service. *Regulation of Fertilizers: Ammonium Nitrate and Anhydrous Ammonia.*

[20] 29 U.S.C. §654(a). Available at: http://www.gpo.gov/fdsys/pkg/USCODE-2010-title29/pdf/USCODE-2010-title29-chap15-sec654.pdf

[21] 29 C.F.R. §1910.38(c). Available at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=9726&p_table=STANDARDS

[22] West Fertilizer Company Risk Management Plan, available at http://www.rtknet.org/db/rmp/rmp.php?facility_id=100000135597&datype=T&reptype=f&detail=4&submit=GO

[23] 29 C.F.R. §1910.109. Available at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=9755&p_table=STANDARDS

1910.109(a)(1) *– "Blasting agent - any material or mixture, consisting of a fuel and oxidizer, intended for blasting, not otherwise classified as an explosive and in which none of the ingredients are classified as an explosive, provided that the finished product, as mixed and packaged for use or shipment, cannot be detonated by means of a No. 8 test blasting cap when unconfined."*

Section **1910.109(g)**, which addresses "blasting agents", specifically makes reference to ammonium nitrate handling in mixing facilities, and it provides recommended separation distances of ammonium nitrate and blasting agents from explosives or blasting agents.

In addition, section **1910.109(i)** provides specific requirements for the storage of ammonium nitrate – but does not apply to transportation. The following paragraphs are taken from OSHA Standard 1910.109:

1910.109(i)(1)(i)(a) – *"Except as provided in paragraph (i)(1)(i)(d) of this paragraph applies to the storage of ammonium nitrate in the form of crystals, flakes, grains, or prills including fertilizer grade, dynamite grade, nitrous oxide grade, technical grade, and other mixtures containing 60 percent or more ammonium nitrate by weight but does not apply to blasting agents."*

1910.109(i)(1)(ii)(b) – *"The standards for ammonium nitrate (nitrous oxide grade) are those found in the "Specifications, Properties, and Recommendations for Packaging, Transportation, Storage, and Use of Ammonium Nitrate", available from the Compressed Gas Association, Inc., which is incorporated by reference as specified in Sec. 1910.6".*

Compliance Requirements

1910.109(i)(2)(i) *– "This paragraph applies to all persons storing, having, or keeping ammonium nitrate, and to the owner or lessee of any building, premises, or structure in which ammonium nitrate is stored in quantities of 1,000 pounds or more."*

1910.109(i)(2)(ii) – "*Approval of large quantity storage shall be subject to due consideration of the fire and explosion hazards, including exposure to toxic vapors from burning or decomposing ammonium nitrate."*

Some of the specific requirements for the storage of ammonium nitrate, among others, which West Fertilizer Company should have complied with are the following:

1910.109(i)(2)(iii)(a) *– "... Storage buildings shall not be over one story in height."*

1910.109(i)(2)(iii)(b) *– "Storage buildings shall have adequate ventilation or be of a construction that will be self-ventilating in the event of fire."*

1910.109(i)(2)(iii)(c) *– "The wall on the exposed side of a storage building within 50 feet of a combustible building, forest, piles of combustible materials and similar exposure hazards shall be of fire-resistive construction…"*

1910.109(i)(2)(iii)(e) *– "The continued use of an existing storage building or structure not in strict conformity with this paragraph may be approved in cases where such continued use will not constitute a hazard to life."*

1910.109(i)(2)(iii)(f) *– "Buildings and structures shall be dry and free from water seepage through the roof, walls, and floors."*

1910.109(i)(4)(i)(a) – *"Warehouses shall have adequate ventilation or be capable of adequate ventilation in case of fire."*

1910.109(i)(7)(ii)(b) – *"Water supplies and fire hydrants shall be available in accordance with recognized good practices."*

Some of the requirements are summarized in the following table:

Description	**OSHA 1910.109 Requirement**
Piles size	H: 20 ft (6.1 m) W: 20 ft (6.1 m) L: 50 ft (15.2 m)
Piles – walls distance	30 inches (0.762 m)
Pile – roof distance	36 inches (0.91 m)
Pile – pile distance	3 ft (0.91 m)
Storage buildings requirements	The **wall** on the exposed side of a storage building within 50 ft of a combustible building = **fire resistant**
Contaminants	Include, but it is not limited to animal fats, baled cotton, baled rags, baled scrap paper, bleaching powder, burlap or cotton bags, caustic soda, coal, coke, charcoal, cork, camphor, excelsior, fibers of any kind, fish oils, fish meal, foam rubber, hay, lubricating oil, linseed oil, or other oxidizable or drying oils, naphthalene, oakum, oiled clothing, oiled paper, oiled textiles, paint, straw, sawdust, wood shavings, or vegetable oils.

Standard 1910.1200: Hazard Communication[24]

Brief summary of regulation
The goal of this standard is to ensure that employers provide employees adequate information about the hazards of all substances handled at the facility. West Fertilizer Company was covered under this regulation, according to the following paragraph taken from the standard:

> ***1910.1200(b)(2) –*** *"This section applies to any chemical which is known to be present in the workplace in such a manner that employees may be exposed under normal conditions of use or in a foreseeable emergency."*

Compliance requirements
The West facility was required to comply with the following requirements (among others) under OSHA's hazard communication standard:

> ***1910.1200(a)(2) –*** *"Classifying the potential hazards of chemicals and communicating information concerning hazards and appropriate protective measures to employees, may include, for example, but is not limited to, provisions for*
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> - *developing and maintaining a written hazard communication program for the workplace,*
> - *including lists of hazardous chemicals present;*
> - *labeling of containers of chemicals in the workplace, as well as of containers of chemicals being shipped to other workplaces;*
> - *preparation and distribution of safety data sheets to employees and downstream employers; and*
> - *development and implementation of employee training programs regarding hazards of chemicals and protective measures."*
>
> ***1910.1200(d)(1) –*** *"Chemical manufacturers and importers shall evaluate chemicals produced in their workplaces or imported by them to classify the chemicals in accordance with this section. For each chemical, the chemical manufacturer or importer shall determine the hazard classes, and, where appropriate, the category of each class that apply to the chemical being classified. Employers are not required to classify chemicals unless they choose not to rely on the classification performed by the chemical manufacturer or importer for the chemical to satisfy this requirement."*

The written hazard communication program should include the following:

> ***1910.1200(e)(1) –*** *"…at least describes how the criteria specified in paragraphs (f), (g), and (h) of this section for labels and other forms of warning, safety data sheets, and employee information and training will be met, and which also includes the following:*

[24] 29 C.F.R. §1910.1200.
http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=10099

- A list of the hazardous chemicals known to be present using a product identifier that is referenced on the appropriate safety data sheet (the list may be compiled for the workplace as a whole or for individual work areas); and,

- The methods the employer will use to inform employees of the hazards of non-routine tasks (for example, the cleaning of reactor vessels), and the hazards associated with chemicals contained in unlabeled pipes in their work areas."

Standard 1910.119: Process Safety Management of Highly Hazardous Chemicals[25]

Brief summary of regulation
The Process Safety Management (PSM) standard *"contains requirements for preventing or minimizing the consequences of catastrophic releases of toxic, reactive, flammable, or explosive chemicals"* [26]. Even though West Fertilizer stored ammonia in excess of the threshold specified for ammonia in the PSM standard, this regulation did not apply to West Fertilizer Company, because of the exemption granted to retail facilities.

Compliance Requirements for facilities covered by the PSM standard
Companies covered under the PSM standard must develop and implement a program covering the following 14 elements:

- Employee Participation
- Process Safety Information
- Process Hazard Analysis
- Operating Procedures
- Training
- Contractor Safety
- Pre-Startup Safety Review
- Mechanical Integrity
- Hot Work Program
- Management of Change
- Incident Investigation
- Emergency Planning and Response
- Compliance Audits
- Trade Secrets

[25] 29 C.F.R. §1910.119. Available at: http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9760
[26] 29 C.F.R. §1910.119.

APPENDIX B
Potential Coverage/Oversight of West Fertilizer by EPA Regulations

The US Environmental Protection Agency (EPA) is authorized to regulate production, distribution, storage, and release of most chemicals in commerce. The Emergency Planning and Community Right to Know Act (EPCRA) and Section 112(r) of the Clean Air Act (CAA) directly address the potential risks from facilities holding chemical hazards[27]. *Both EPCRA and the CAA section 112(r) Risk Management Program encourage communication between facilities and the surrounding communities about chemical safety and chemical risks*[28].

The Emergency Planning and Community Right-to-Know Act (EPCRA)
EPCRA has four major provisions[29]*:*

- *Emergency planning (sections 301-303),Office of Emergency Management Factsheet EPCRA September 2012*
- *Emergency release notification (section 304),*
- *Hazardous chemical storage reporting requirements (sections 311-312), and*
- *Toxic chemical release inventory (section 313).*

*EPCRA, **Section 311**, requires owners or operators of local facilities covered by the Occupational Safety and Health Act to submit a material safety data sheet (MSDS) for each "**hazardous chemical**," or a list of such chemicals, to the SERC, the LEPC, and the local fire department.*

*EPCRA, **Section 312**, requires the same employers to submit annually an emergency and hazardous chemical inventory form to the SERC, LEPC, and local fire department. These forms must provide estimates of:*

- *Maximum amount of the chemicals present at the facility at any time during the preceding year*
- *Average daily amount of chemicals present*
- *General location of the chemicals in the facility*

The West Fertilizer facility was exempt from the EPCRA requirements because of exemptions granted to retail fertilizer facilities. EPCRA Section 311(e)(5) excludes certain substances, including "fertilizer held for sale by a retailer to the ultimate customer."[30] [31]

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[27] Shea, D., Schierow, L. and Szymendera, S. (2013). Regulation of Fertilizers: Ammonium Nitrate and Anhydrous Ammonia. CRS Report for Congress. Available at: http://www.fas.org/sgp/crs/homesec/R43070.pdf
[28] How LEPCs and Other Local can include information from RMP in their ongoing work: http://www.epa.gov/oem/docs/chem/lepc-rmp.pdf
[29] What Does EPCRA Cover: http://www.epa.gov/oem/docs/chem/epcra.pdf
[30] Exemptions under Sections 311 and 312: http://www.epa.gov/osweroe1/content/epcra/epcra-qa_exempt_311.htm#s311e5_4
[31] http://emergencymanagement.supportportal.com/link/portal/23002/23016/Article/13919/Are-farm-suppliers-and-retailers-exempt-from-311-and-312

Section 112(r) of the Clean Air Act[32]

Background

- *The Act requires EPA to promulgate an initial list of at least 100 substances that, in the event of an accidental release*[33]*, are known to cause or may reasonably be anticipated to cause death, injury, or serious adverse effects to human health or the environment*[34]*.*
- *In developing this list, EPA was required to consider, but was not limited to, the list of extremely hazardous substances (EHSs) promulgated under EPCRA (SARA Title III) section 302. EPA did not propose to adopt the entire EHS list because it includes a number of* ***solids and non-volatile liquids*** *for which an effect beyond the fenceline in the event of an accidental release is expected to be less likely than for gaseous or volatile liquids*[35]*.*
- *Congress listed the following 16 substances to be included in the initial list (Chlorine,* ***ammonia and anhydrous ammonia****, methyl chloride, ethylene oxide, vinyl chloride, methyl isocyanate, hydrogen cyanide, hydrogen sulfide, toluene diisocyanate, phosgene, bromine, anhydrous hydrogen chloride, hydrogen fluoride, anhydrous sulfur dioxide, and sulfur trioxide).*
- *Explosive materials (Division 1.1. under DOT classification) were initially included in the list of highly hazardous materials when the EPA regulation was developed. However, explosive materials were delisted*[36] *in 1998 with the proviso that ATF covered all the aspects that are necessary under RMP, except for public disclosure*[37]*. The industry voluntarily agreed to make that public disclosure that makes it equivalent to RMP.*

The West Fertilizer facility was covered under Program 2 of the EPA Risk Management Program because of ammonia. However, ammonium nitrate is not included in the covered list and West Fertilizer would not have had to report any analysis or calculations regarding ammonium nitrate in their submissions to EPA.

Table B-1 shows a summary of the criteria used by EPA for determining extremely hazardous materials and the corresponding thresholds to be covered under the RMP rule. Based Table B-1, ammonium nitrate is not covered by the RMP rule because ammonium nitrate does not meet the requirements to be considered as toxic or flammable.

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[32] Clean Air Act Section 112(r): Accidental release prevention/RMP Rule: http://www.epa.gov/osweroe1/docs/chem/caa112_rmp_factsheet.pdf

[33] Based on CAA Section 112(r)(2)(A): An accidental release is defined as "an unanticipated emission...into the ambient air from a stationary source."

[34] EPA list of regulated substances and thresholds: http://www.ncair.org/112r/files/40cfr68(9&68)_01141994.pdf

[35] EPA list of regulated substances and thresholds (pag 19): http://www.ncair.org/112r/files/40cfr68(9&68)_01141994.pdf

[36] RMP rule amendments: http://www.epa.gov/R5Super/cepps/pdfs/applicability-faq-200405.pdf

[37] RMP hearing. March 1999: http://books.google.com/books?id=oyy7IP0X3lAC&pg=PA18&lpg=PA18&dq=rmp+include+explosives?&source=bl&ots=hPVRLfJ49y&sig=3lguj7tddGoZH6Y05IkyagjetwM&hl=en&sa=X&ei=rtrEUYDvE9KJrQGV3IGIDw&ved=0CEcQ6AEwAw#v=onepage&q=rmp%20include%20explosives%3F&f=false

Table B-1. Summary of categories and thresholds of extremely hazardous materials[38]:

Categories	Requirements	Threshold quantities (lb)*
77 Toxic substances	*Acute toxicity:* - Inhalation: LC50 = 0.5 mg/L or - Dermal: LD50 = 50 mg/kg of body weight, or - Oral: LD50 = 25 mg/kg of body weight *Vapor pressure* >10 mmHg *Accident history*	500 – 20,000
63 Flammable substances	FP < 73 ^{o}F (22.8 ^{o}C) BP < 100 ^{o}F (37.8 ^{o}C)	10,000

*Substances in mixtures would be exempted from the threshold determination if they represent less than one percent of the mixture by weight. (EPA List of Regulated Substances is found in reference 39)[39].

- **Listing criteria:**
  - ***Toxicity:*** *Listed toxic substances are expected to rapidly become airborne, thus human exposure by the inhalation route is of primary concern. The listing criteria established for toxic substances considers not only acute toxicity, but also physical/chemical properties (physical state, vapor pressure), and accident history.*
    The acute toxicity criteria:
    (a) Inhalation LC50 0.5 milligrams per liter of air (for exposure time 8 hours), or
    (b) Dermal LD50 50 milligrams per kilogram of body weight, or
    (c) Oral LD50 25 milligrams per kilogram of body weight.

    Vapor pressure cut off:
    *Initially, a vapor pressure criterion of **0.5 mm Hg** was used as a baseline, based on the vapor pressure of toluene diisocyanate, a substance mandated for the initial list by Congress. However, EPA considered that this low vapor pressure level may lead to an overly conservative listing of chemicals that pose a relatively lower potential for air releases. Then, **EPA decided to set the vapor pressure criterion at the higher level of 10 mm Hg**. Substances with pressures above 10 mm Hg are likely to be volatilized and released, even after a timely facility response occurs, potentially causing off-site impacts.*

    Accident history:
    Substances that "are known to cause ... death, injury, or serious adverse effects on human health or the environment" may be included on the list under section 112(r)(3).

  - ***Flammable gases and volatile flammable liquids:*** *Based on the flash point (FP) and boiling point (BP) criteria used by NFPA. Based on both accident reports and modeling*

[38] EPA list of regulated substances and thresholds: http://www.ncair.org/112r/files/40cfr68(9&68)_01141994.pdf
[39] http://www.epa.gov/R5Super/cepps/pdfs/rmp-listed-chemicals-200708.pdf

results, EPA considered that flammable substances that meet the listing criteria, in quantities above the threshold quantity of 10,000 lb, could present a hazard to the public from a vapor cloud explosion.
OSHA's PSM Standard provides an exemption for flammable liquids kept in atmospheric tanks below their normal boiling point. Unlike OSHA, EPA considers these substances to be intrinsically hazardous, regardless of conditions of storage, and, therefore, no exemption is provided in those cases.

Requirements if ammonium nitrate were covered by CAA 112:
EPA defined three "program levels" to ensure that individual chemical processes are subject to appropriate requirements based on the size of the process and the associated risks [40].

- **Program 1 eligibility (provided in section § 68.10) [41].**

1. *For the five years prior to the submission of an RMP, the process has not had an accidental release of a regulated substance where exposure to the substance, its reaction products, overpressure generated by an explosion involving the substance, or radiant heat generated by a fire involving the substance led to any of the following offsite: (i) Death; (ii) Injury; or (iii) Response or restoration activities for an exposure of an environmental receptor.*
2. *The distance to a toxic or flammable endpoint for a worst-case release assessment conducted under Subpart B and § 68.25 is* ***less than the distance to any public receptor****, as defined in § 68.30.*
3. *Emergency response procedures have been coordinated between the stationary source and local emergency planning and response organizations.*

- **Program 1 requirements (provided in section § 68.12):**

1. *Analyze the worst-case release scenario for the process(es), as provided in § 68.25; document that the nearest public receptor is beyond the distance to a toxic or flammable endpoint defined in § 68.22(a); and submit in the RMP the worst-case release scenario as provided in § 68.165;*
2. *Complete the five-year accident history for the process as provided in § 68.42 of this part and submit it in the RMP as provided in § 68.168;*
3. *Ensure that response actions have been coordinated with local emergency planning and response agencies; and*
4. *Certify in the RMP the following: Based on the criteria in 40 CFR 68.10, the distance to the specified endpoint for the worst-case accidental release scenario for the following process(es) is less than the distance to the nearest public receptor: Within the past five years, the process(es) has (have) had no accidental release that caused offsite impacts provided in the risk management program rule (40 CFR 68.10(b)(1)).*

- **Program 2 eligibility (provided in section § 68.10):**

A covered process is subject to Program 2 requirements if it does not meet the eligibility requirements of program 1 and 3.

- **Program 2 requirements (provided in section § 68.12):**

1. *Develop and implement a management system as provided in § 68.15;*
2. *Conduct a hazard assessment as provided in Sec.§ 68.20 through 68.42;*

[40] RMP requirements: http://www.epa.gov/emergencies/docs/chem/clean_air_guidance.pdf
[41] APPENDIX A. 40 CFR 68(pag 9): http://www.epa.gov/osweroe1/docs/chem/Appendix-A-final.pdf

3. *Implement the Program 2 prevention steps provided in Sec.§ 68.48 through 68.60 or implement the Program 3 prevention steps provided in Sec.§ 68.65 through 68.87;*

- **Program 3 eligibility (provided in section § 68.10):**

A covered process is subject to Program 3 if the process does not meet the requirements of program 1 of this section, and if either of the following conditions is met:

1. *The process is in NAICS code 32211, 32411, 32511, 325181, 325188, 325192, 325199, 325211, 325311, or 32532;* ***or***
2. *The process is subject to the OSHA process safety management standard, 29 CFR 1910.119.*

- **Program 3 requirements (provided in section § 68.12):**

1. *Develop and implement a management system as provided in § 68.15;*
2. *Conduct a hazard assessment as provided in Sec.§ 68.20 through 68.42;*
3. *Implement the prevention requirements of Sec.§ 68.65 through 68.87;*
4. *Develop and implement an emergency response program as provided in Sec.§ 68.90 to 68.95 of this part; and*
5. *Submit as part of the RMP the data on prevention program elements for Program 3 processes as provided in § 68.175.*

Figure B-1 can be used to identify the program level. In general, the requirements under the RMP rule include development of a hazard assessment, a prevention program, and an emergency response program.[42]

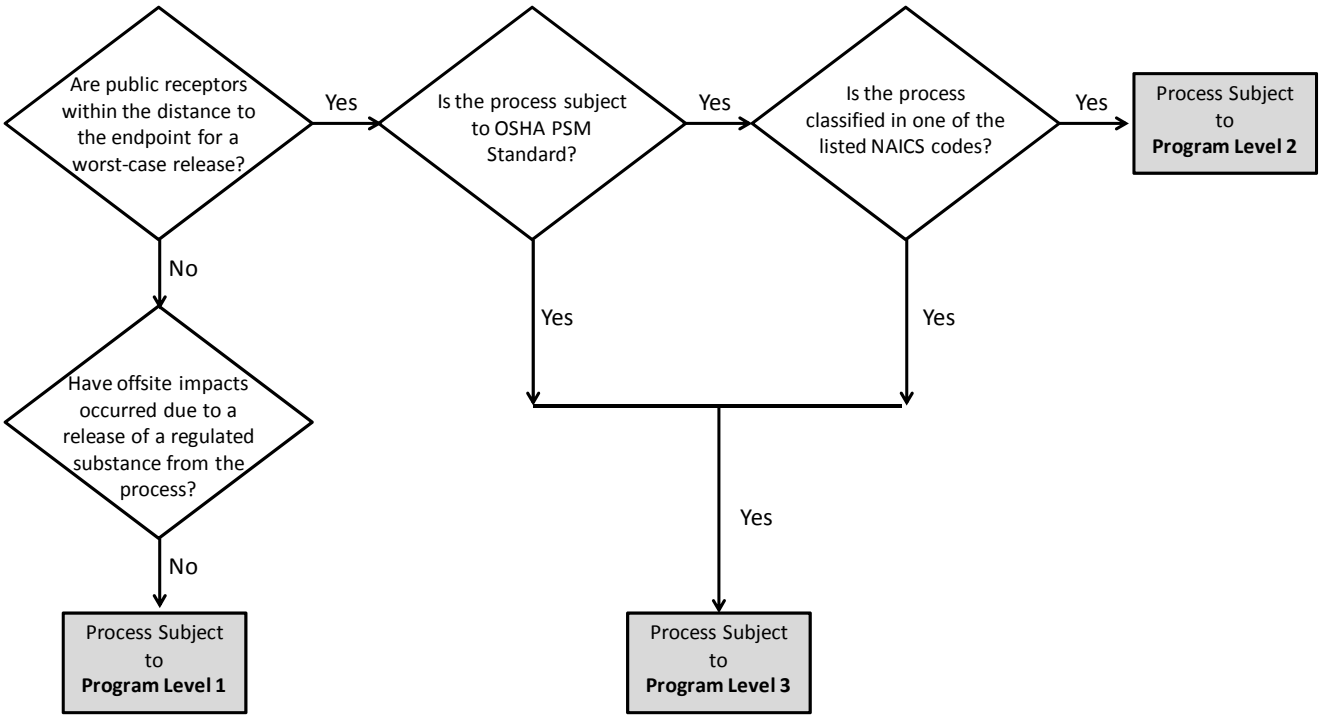

Fig. B-1. Diagram of the decision rules on determining Program level[43]

[42] http://www.epa.gov/osweroe1/docs/chem/ammonitr.pdf
[43] Decision rules on determining EPA Program level: http://www.epa.gov/osweroe1/docs/chem/Chap-02-final.pdf

Based on the eligibility criteria, West Fertilizer Company would not be included in Program 1 because the distance to a toxic or flammable endpoint for a worst-case release assessment is greater than the distance to any public receptor.

The West Fertilizer facility would not be included in Program 3 because the company NAICS code (42451-Facility grain and field bean merchant wholesalers) is not listed in the Program 3 eligibility requirements AND the West Fertilizer facility is excluded from the PSM program because of the retail exemption.

Hence, the West Fertilizer facility would be covered by Program 2 of the EPA Risk Management Program, but only because of the storage of ammonia.

APPENDIX C

Potential Coverage/Oversight of West Fertilizer by DHS Regulations

With regard to ammonium nitrate, DHS regulations include the proposed rule regulating the control of the purchase and the sales of AN (Section 563) and the Chemical Facility Anti-Terrorism Standards (CFATS). To-date, DHS has not published the final rule mandated under the congressional statute (Section 563) summarized below. CFATS regulation is administered by DHS, and the requirements under CFATS are also discussed in this Appendix.

Section 563, Subtitle J, Secure Handling of Ammonium Nitrate Public Law 110-161

Section 563 of the 2008 Consolidated Appropriations Act, Subtitle J, Secure Handling of Ammonium Nitrate ("Section 563"), Public Law 110-161,[44] requires the Department of Homeland Security to "regulate the sale and transfer of ammonium nitrate by an ammonium nitrate facility ... to prevent the misappropriation or use of ammonium nitrate in an act of terrorism." [45]

''Subtitle J—Secure Handling of Ammonium Nitrate

> *SEC. 899A. DEFINITIONS.*
> *SEC. 899B. REGULATION OF THE SALE AND TRANSFER OF AMMONIUM NITRATE.*
> *SEC. 899C. INSPECTION AND AUDITING OF RECORDS.*
> *SEC. 899D. ADMINISTRATIVE PROVISIONS.*
> *SEC. 899E. THEFT REPORTING REQUIREMENT.*
> *SEC. 899F. PROHIBITIONS AND PENALTY.*
> *SEC. 899G. PROTECTION FROM CIVIL LIABILITY.*
> *SEC. 899H. PREEMPTION OF OTHER LAWS.*
> *SEC. 899I. DEADLINES FOR REGULATIONS.*
> *SEC. 899J. AUTHORIZATION OF APPROPRIATIONS."*

For example, SEC. 899B, states:

"SEC. 899B. REGULATION OF THE SALE AND TRANSFER OF AMMONIUM NITRATE.
(a) IN GENERAL.—The Secretary shall regulate the sale and transfer of ammonium nitrate by an ammonium nitrate facility in accordance with this subtitle to prevent the misappropriation or use of ammonium nitrate in an act of terrorism.
(b) AMMONIUM NITRATE MIXTURES.—Not later than 90 days after the date of the enactment of this subtitle, the Secretary, in consultation with the heads of appropriate Federal departments and agencies (including the Secretary of Agriculture), shall, after notice and an opportunity for comment, establish a threshold percentage for ammonium nitrate in a substance.
(c) REGISTRATION OF OWNERS OF AMMONIUM NITRATE FACILITIES.—
(1) REGISTRATION.—The Secretary shall establish a process by which any person that—

[44] 2008 Consolidated Appropriations Act, Subtitle J, Secure Handling of Ammonium Nitrate ("Section 563", Public Law 110–161) http://www.gpo.gov/fdsys/pkg/PLAW-110publ161/pdf/PLAW-110publ161.pdf
[45] http://www.dhs.gov/ammonium-nitrate-security-statutes-and-regulations

(A) owns an ammonium nitrate facility is required to register with the Department; and

(B) registers under subparagraph (A) is issued a registration number for purposes of this subtitle.

(2) REGISTRATION INFORMATION.—Any person applying to register under paragraph (1) shall submit to the Secretary—

(A) the name, address, and telephone number of each ammonium nitrate facility owned by that person;

(B) the name of the person designated by that personas the point of contact for each such facility, for purposes of this subtitle; and

(C) such other information as the Secretary may determine is appropriate.

(d) REGISTRATION OF AMMONIUM NITRATE PURCHASERS.—

(1) REGISTRATION.—The Secretary shall establish a process by which any person that—

(A) intends to be an ammonium nitrate purchaser is required to register with the Department; and

(B) registers under subparagraph (A) is issued a registration number for purposes of this subtitle.

(2) REGISTRATION INFORMATION.—Any person applying to register under paragraph (1) as an ammonium nitrate purchaser shall submit to the Secretary—

(A) the name, address, and telephone number of the applicant; and

(B) the intended use of ammonium nitrate to be purchased by the applicant.

(e) RECORDS.—

(1) MAINTENANCE OF RECORDS.—The owner of an ammonium nitrate facility shall—

(A) maintain a record of each sale or transfer of ammonium nitrate, during the two-year period beginning on the date of that sale or transfer; and

(B) include in such record the information described in paragraph (2).

(2) SPECIFIC INFORMATION REQUIRED.—For each sale or transfer of ammonium nitrate, the owner of an ammonium nitrate facility shall—

(A) record the name, address, telephone number, and registration number issued under subsection (c) or (d) of each person that purchases ammonium nitrate, in a manner prescribed by the Secretary;

(B) if applicable, record the name, address, and telephone number of an agent acting on behalf of the person described in subparagraph (A), at the point of sale;

(C) record the date and quantity of ammonium nitrate sold or transferred; and

(D) verify the identity of the persons described in subparagraphs (A) and (B), as applicable, in accordance with a procedure established by the Secretary.

(3) PROTECTION OF INFORMATION .—In maintaining records in accordance with paragraph (1), the owner of an ammonium nitrate facility shall take reasonable actions to ensure the protection of the information included in such records.

(f) EXEMPTION FOR EXPLOSIVE PURPOSES .—The Secretary may exempt from this subtitle a person producing, selling, or purchasing ammonium nitrate exclusively for use in the production of an explosive under a license or permit issued under chapter 40 of title 18, United States Code.

(g) CONSULTATION .—In carrying out this section, the Secretary shall consult with the Secretary of Agriculture, States, and appropriate private sector entities, to ensure that the access of agricultural producers to ammonium nitrate is not unduly burdened.

(h) DATA CONFIDENTIALITY .—……
(i) REGISTRATION PROCEDURES AND CHECK OF TERRORIST SCREENING DATABASE .—

(1) REGISTRATION PROCEDURES .—

(A) GENERALLY .—The Secretary shall establish procedures to efficiently receive applications for registration numbers under this subtitle, conduct the checks required under paragraph (2), and promptly issue or deny a registration number.

(B) INITIAL SIX -MONTH REGISTRATION PERIOD .—The Secretary shall take steps to maximize the number of registration applications that are submitted and processed during the six-month period described in section 899F(e).

(2) CHECK OF TERRORIST SCREENING DATABASE .—

(A) CHECK REQUIRED .—The Secretary shall conduct a check of appropriate identifying information of any person seeking to register with the Department under subsection (c) or (d) against identifying information that appears in the terrorist screening database of the Department."

Chemical Facility Anti-Terrorism Standards (CFATS)

CFATS addresses hundreds of chemicals, including ammonium nitrate, and is directed at the security of high-risk facilities. DHS stated in the CFATS interim final rule that "if a retail establishment does exceed any of these [screening threshold quantities], *the retail establishment will have to complete the Top-Screen*."[46]

The DHS lists 322 chemicals and screening threshold quantities for each chemical to determine the need to comply with CFATS[47]. The DHS considers each chemical in the context of three threats: release; theft or diversion; and sabotage and contamination. The regulation lists two formulations of ammonium nitrate (one used as a blasting agent, the other as fertilizer) as a chemical of interest and identifies them as release and theft or diversion threats.

The screening threshold quantity differs depending on whether the ammonium nitrate is a blasting agent or fertilizer. Facilities having at least 5,000 lbs of AN (400 lbs, if packaged for transportation), as a blasting agent (ammonium nitrate with more than 0.2% combustible substances), or at least 2,000 lbs of transportable fertilizer (with nitrogen concentration of 23% or greater, or fertilizer mixture containing at least 33% of AN) are considered a high risk facility. Therefore, they should follow CFATS[48].

"Assignment of tiers is based on an assessment of the potential consequences of a successful attack on assets associated with chemicals of interest. The Department of Homeland Security uses information submitted by facilities through the Chemical Security Assessment Tool Top Screen and Security Vulnerability Assessment (SVA) processes to identify a facility's risk, which is a function of the potential impacts of an attack (consequences), the likelihood that an attack on

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[46] 72 Federal Register 17688-17745 (April 9, 2007) at 17697 (in page 17697, it is the last sentence of "1. Definition of ``Chemical Facility or Facility"", right above "2. Multiple Owners and Operators"). http://www.gpo.gov/fdsys/pkg/FR-2007-04-09/html/E7-6363.htm

[47] DHS list of chemicals: http://www.dhs.gov/xlibrary/assets/chemsec_appendixa-chemicalofinterestlist.pdf

[48] 72 Federal Register 65396-65435 (November 20, 2007) at 65407, http://www.gpo.gov/fdsys/pkg/FR-2007-11-20/html/07-5585.htm

the facility would be successful (vulnerabilities), and the likelihood that such an attack would occur at the facility (threat). All facilities that were individually requested by the Assistant Secretary or that meet the criteria in Appendix A [of CFATS] *must complete the CSAT Top Screen. The highest tier facilities, or Phase 1 facilities, are those specifically requested by the Assistant Security to complete the Top Screen; these are addressed by the Department first. All facilities that must complete the Top Screen are preliminarily tiered. These facilities are required to complete a Security Vulnerability Assessment (SVA), which provides more in-depth information that allows the Department to assign a final risk tier ranking to the facility. Preliminarily tier 1, 2, and 3 facilities must subsequently submit a CSAT Security Vulnerability Assessment. Tier 4 facilities may submit an Alternative Security Program (ASP) for the Department of Homeland Security to consider in accordance with 67 CFR 27.235(a). Tier 3 and 4 facilities may choose to submit an Alternative Security Plan for the Site Security Plan for consideration by the Department in accordance with 6 CFR 27.235(a)."* [49]

Top screen questions:
http://www.dhs.gov/xlibrary/assets/chemsec_csattopscreenquestions.pdf
http://www.dhs.gov/xlibrary/assets/chemsec_csattopscreenusersmanual.pdf

Security Vulnerability Assessment (SVA) questions:
https://www.dhs.gov/sites/default/files/publications/chemicalsecurity_svaquestions%20v3.pdf

[49] http://www.dhs.gov/risk-chemical-facility-anti-terrorism-standards-cfats

APPENDIX D
Potential Coverage/Oversight of West Fertilizer by DOT Regulations

Ammonium nitrate is covered by DOT, according to the following paragraph taken from **§ 173.127**:

"*173.127 Class 5, Division 5.1—Definition and assignment of packing groups. (a) Definition. For the purpose of this subchapter, oxidizer (Division 5.1) means a material that may, generally by yielding oxygen, cause or enhance the combustion of other materials. (1) A solid material is classed as a Division 5.1 material if, when tested in accordance with the UN Manual of Tests and Criteria (IBR, see § 171.7 of this subchapter), its mean burning time is less than or equal to the burning time of a 3:7 potassium bromate/cellulose mixture. (2) A liquid material is classed as a Division 5.1 material if, when tested in accordance with the UN Manual of Tests and Criteria, it spontaneously ignites or its mean time for a pressure rise from 690 kPa to 2070 kPa gauge is less then the time of a 1:1 nitric acid (65 percent)/cellulose mixture.*"[50]

All DOT requirements for ammonium nitrate are with regard to safe transportation. Last known inspection of the West Fertilizer site was conducted by DOT on September 23, 2011. The inspection resulted in a fine of $5,250 with a total of 2 violations; illegible data on ASME placards and/or missing flammable gas placards (front and/or rear) and no security plan.[51] [52] [53] All the penalties/fines were with regard to anhydrous ammonia.

"**Section 172.800(b)**[54] states, in part, "*Each person who offers for transportation in commerce or transports in commerce one or more of the following hazardous materials must develop and adhere to a transportation security plan for hazardous materials that conforms to the requirements of this subpart. As used in this section, "large bulk quantity" refers to a quantity greater than 3,000 kg (6,614 pounds) for solids or 3,000 liters (792 gallons) for liquids and gases in a single packaging such as a cargo tank motor vehicle, portable tank, tank car, or other bulk container.*"

Section 172.802(b) [55] states *(a) "The security plan must include an assessment of transportation security risks for shipments of the hazardous materials listed in §172.800, including site-specific or location-specific risks associated with facilities at which the hazardous materials listed in*

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[50] 49 CFR § 173.127. Available at: http://www.gpo.gov/fdsys/pkg/CFR-2010-title49-vol2/pdf/CFR-2010-title49-vol2-sec173-127.pdf

[51] Inspection / Investigation Report No. 1220047. Available at: http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Press%20Releases/west_fertilizer_rpt_redact.pdf

[52] Compromise order. Available at: http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Hazmat/Enforcement/West%20Fertilizer%20Comp%20Order%20Jun%202012.pdf

[53] Notice of Probable Violation. Available at: http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Hazmat/Enforcement/West%20Fertilizer%20NOPV%20Jan2012.pdf

[54] 49 CFR §172.800. Available at http://www.gpo.gov/fdsys/pkg/CFR-2011-title49-vol2/pdf/CFR-2011-title49-vol2-sec172-800.pdf

[55] 49 CFR §172.802b. Available at: http://www.gpo.gov/fdsys/pkg/CFR-2011-title49-vol2/pdf/CFR-2011-title49-vol2-sec172-800.pdf

§172.800 *are prepared for transportation, stored, or unloaded incidental to movement, and appropriate measures to address the assessed risks. Specific measures put into place by the plan may vary commensurate with the level of threat at a particular time. At a minimum, a security plan must include the following elements:*

(1) Personnel security. Measures to confirm information provided by job applicants hired for positions that involve access to and handling of the hazardous materials covered by the security plan. Such confirmation system must be consistent with applicable Federal and State laws and requirements concerning employment practices and individual privacy.

(2) Unauthorized access. Measures to address the assessed risk that unauthorized persons may gain access to the hazardous materials covered by the security plan or transport conveyances being prepared for transportation of the hazardous materials covered by the security plan.

(3) En route security. Measures to address the assessed security risks of shipments of hazardous materials covered by the security plan en route from origin to destination, including shipments stored incidental to movement.

(b) The security plan must also include the following:

(1) Identification by job title of the senior management official responsible for overall development and implementation of the security plan;

(2) Security duties for each position or department that is responsible for implementing the plan or a portion of the plan and the process of notifying employees when specific elements of the security plan must be implemented; and

(3) A plan for training hazmat employees in accordance with §172.704 (a)(4) and (a)(5) of this part.

(c) The security plan, including the transportation security risk assessment developed in accordance with paragraph (a) of this section, must be in writing and must be retained for as long as it remains in effect. The security plan must be reviewed at least annually and revised and/or updated as necessary to reflect changing circumstances. The most recent version of the security plan, or portions thereof, must be available to the employees who are responsible for implementing it, consistent with personnel security clearance or background investigation restrictions and a demonstrated need to know. When the security plan is updated or revised, all employees responsible for implementing it must be notified and all copies of the plan must be maintained as of the date of the most recent revision.

(d) Each person required to develop and implement a security plan in accordance with this subpart must maintain a copy of the security plan (or an electronic file thereof) that is accessible at, or through, its principal place of business and must make the security plan available upon request, at a reasonable time and location, to an authorized official of the Department of Transportation or the Department of Homeland Security."

APPENDIX E
Potential Coverage/Oversight of West Fertilizer by ATF Regulations

The Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) regulates ammonium nitrate-based blasting agents. It has regulations on the necessary distance to be maintained between ammonium nitrate and other explosive materials.

Subpart K – Storage§555.202.[56] *Classes of explosive materials.*
"(c) Blasting agents. (For example, ammonium nitrate-fuel oil and certain water-gels (see also § 555.11)."
§ 555.11 Blasting agent.[57] ***"****Any material or mixture, consisting of fuel and oxidizer, that is intended for blasting and not otherwise defined as an explosive; if the finished product, as mixed for use or shipment, cannot be detonated by means of a number 8 test blasting cap when unconfined. A number 8 test blasting cap is one containing 2 grams of a mixture of 80 percent mercury fulminate and 20 percent potassium chlorate, or a blasting cap of equivalent strength. An equivalent strength cap comprises 0.40–0.45 grams of PETN base charge pressed in an aluminum shell with bottom thickness not to exceed to 0.03 of an inch, to a specific gravity of not less than 1.4 g/cc., and primed with standard weights of primer depending on the manufacturer."*

§ 555.220 Table of separation distances of ammonium nitrate and blasting agents from explosives or blasting agents.

Donor weight (pounds)		Minimum separation distance of acceptor from donor when barricaded (feet)		Minimum thickness of artificial barricades (inches)
Over	Not over	Ammonium nitrate	Blasting agent	
0	100	3	11	12
100	300	4	14	12
300	600	5	18	12
600	1,000	6	22	12
1,000	1,600	7	25	12
1,600	2,000	8	29	12
2,000	3,000	9	32	15
3,000	4,000	10	36	15
4,000	6,000	11	40	15
6,000	8,000	12	43	20
8,000	10,000	13	47	20
10,000	12,000	14	50	20
12,000	16,000	15	54	25
16,000	20,000	16	58	25
20,000	25,000	18	65	25
25,000	30,000	19	68	30
30,000	35,000	20	72	30
35,000	40,000	21	76	30
40,000	45,000	22	79	35
45,000	50,000	23	83	35
50,000	55,000	24	86	35
55,000	60,000	25	90	35
60,000	70,000	26	94	40
70,000	80,000	28	101	40
80,000	90,000	30	108	40
90,000	100,000	32	115	40
100,000	120,000	34	122	50
120,000	140,000	37	133	50
140,000	160,000	40	144	50
160,000	180,000	44	158	50
180,000	200,000	48	173	50
200,000	220,000	52	187	60
220,000	250,000	56	202	60
250,000	275,000	60	216	60
275,000	300,000	64	230	60

Table: National Fire Protection Association (NFPA) Official Standard No. 492, 1968

[56] 555.202 ATF Federal Explosives Law and Regulations (2012)
http://www.atf.gov/files/publications/download/p/atf-p-5400-7.pdf
[57] 555.11 ATF Federal Explosives Law and Regulations(2012)
http://www.atf.gov/files/publications/download/p/atf-p-5400-7.pdf

555.220 (1)[58] *"This table specifies separation distances to prevent explosion of ammonium nitrate and ammonium nitrate-based blasting agents by propagation from nearby stores of high explosives or blasting agents referred to in the table as the "donor." Ammonium nitrate, by itself, is not considered to be a donor when applying this table. Ammonium nitrate, ammonium nitrate-fuel oil or combinations thereof are acceptors. If stores of ammonium nitrate are located within the sympathetic detonation distance of explosives or blasting agents, one-half the mass of the ammonium nitrate is to be included in the mass of the donor."*

However, ATF does not regulate ammonium nitrate as fertilizer because of the exemption in subpart H.

Subpart H- Exemptions §555.141.(a).(8)[59] *"Gasoline,* ***fertilizers****, propellant actuated devices, or propellant actuated industrial tools manufactured, imported, or distributed for their intended purposes."*

If ammonium nitrate as fertilizer was covered by ATF, and stored nearby other explosives or other blasting agents, it would be required to be stored in accordance with the above table. In the case of West Fertilizer, no other explosives are stored nearby to the best of our knowledge. Thus, even if ATF regulations had covered ammonium nitrate as fertilizer, the ammonium nitrate in the West Fertilizer facility would not to be required to be stored in accordance with the above table.

[58] 555.220 (1) ATF Federal Explosives Law and Regulations 2012 http://www.atf.gov/files/publications/download/p/atf-p-5400-7.pdf

[59] ATF Federal Explosives Law and Regulations (2012) http://www.atf.gov/files/publications/download/p/atf-p-5400-7.pdf