

Separation Distances for Solid Ammonium Nitrate in NSW

Discussion Paper

October 2022

Published by

Better Regulation Division
Department of Customer Service
McKell Building
2-24 Rawson Place, Sydney NSW 2000
www.customerservice.nsw.gov.au

Disclaimer

This publication avoids the use of legal language, with information about the law summarised or expressed in general statements. The information in this document should not be relied upon as a substitute for professional legal advice.

For access to legislation in force in NSW go to the official NSW Government website for online publication of legislation at www.legislation.nsw.gov.au

Copyright Information

© State of New South Wales through Department of Customer Service 2022.

This publication must not be relied on as legal advice.

For more information about this topic, visit
<https://www.safework.nsw.gov.au/copyright>.

Table of contents

1. Introduction	4
1.1. Purpose of this Discussion Paper	4
1.2. Benefits of implementing the preferred option	5
1.3. Acronyms and abbreviations used in the discussion paper	6
1.4. Definitions used in the Discussion Paper	7
2. Background	8
2.1. Ammonium nitrate	8
2.2. The NSW industry	8
2.3. Recent incidents	8
3. Current regulatory framework.....	10
3.1. Legislation – <i>Explosives Act</i> and Explosives Regulation	10
3.2. Multi-agency management of ammonium nitrate	10
3.3. Other jurisdictions	11
4. Proposed introduction of separation distances	12
4.1. Prescriptive separation distances	12
4.2. Application of separation distances	13
4.2.1. Method for calculating separation distances	13
4.3. Exceptions	14
4.4. On-site separation distances from ammonium nitrate	14
4.4.1. On-site protected places	14
4.4.2. Separation from other ammonium nitrate stores	15
4.4.3. Separation from explosives and ANE stores	16
4.5. Off-site separation distances from ammonium nitrate	16
4.6. Evacuation time requirements	17
4.7. Impacts on Industry	18
4.8. Interaction with DPE safety planning legislation	19
4.8.1. New solid ammonium nitrate storage sites	19
4.8.2. Existing solid ammonium nitrate storage sites	19
5. Discussion questions	21
6. Making a submission	22
6.1. How to lodge your submission	22
6.2. Next Steps	22

1. Introduction

1.1. Purpose of the Discussion Paper

NSW has a strong multi-agency regulatory regime for the storage of explosives and explosive precursors. Ammonium nitrate is an explosive precursor which is subject to licensing and other safety and security provisions of the *Explosives Act 2003* (Explosives Act) and the Explosives Regulation 2013 (Explosives Regulation). The NSW Government is reviewing its policies on the storage of ammonium nitrate to ensure they meet global best practice to manage the associated risks.

Currently an explosives licence is required to import, export, manufacture, store, supply, use or transport ammonium nitrate in NSW. To approve an explosives licence for ammonium nitrate, SafeWork NSW must be satisfied that a facility is capable of handling ammonium nitrate safely and securely. SafeWork NSW assesses compliance with the requirements of the Australian Standard applicable to ammonium nitrate, AS 4326 – The storage and handling of oxidising agents, as well as a security plan, emergency plan, and the degree of separation to neighbouring sites.

Under Work Health and Safety legislation, quantities of ammonium nitrate that exceed 10,000 kilograms must be notified to SafeWork NSW. Quantities exceeding 2,500 tonnes of ammonium nitrate or 5,000 tonnes of ammonium nitrate fertilisers require a major hazard facility licence. SafeWork NSW co-ordinates a whole of government approval process for major hazard facilities, which involves assessments of security, waste and environmental management, emergency plans, and on-site and off-site risks. SafeWork NSW conducts periodic inspections as part of its post-licence verification programs.

Although the likelihood of an incident at a facility that stores ammonium nitrate in NSW is low, the consequences of any incident could potentially be significant. The NSW Government is considering further measures to mitigate the impact of a potential incident at an ammonium nitrate storage facility.

The explosives legislation currently sets mandatory separation distances for both explosives and the explosive precursor Ammonium Nitrate Emulsion (ANE). Ammonium nitrate is the only substance regulated by the explosives legislation for which there are no prescribed separation distance requirements. Separation distances are one measure which the NSW Government uses to reduce risk to persons and property from ammonium nitrate storage, as part of the risk-management framework outlined above.

AS 4326 – The storage and handling of oxidising agents identifies the need for separation distances for ammonium nitrate but defers to the regulator (SafeWork NSW) to determine those distances. As a result, the assessment of whether to grant a licence for a facility to handle ammonium nitrate in NSW has so far been made on a case-by-case basis. These decisions are made after due consideration of the particular issues associated with the facility. Licenses are granted with appropriate conditions, but the case-by-case approach can be complex, resource-intensive, and may lead to inconsistent outcomes.

The NSW Government is considering introducing prescribed separation distances for ammonium nitrate storage.

The purpose of prescribing separation distances is to introduce an additional level of protection to ensure that communities are protected from an unplanned explosion at an ammonium nitrate storage facility. Under this proposal, the NSW Government would only license facilities that are adequately separated from population centres and infrastructure. The proposal would replace the current case-by-case approach and ensure a consistent decision-making process with clear guidance and certainty for industry. This Discussion Paper sets out a proposal for prescribing separation distances. We invite your feedback on the proposal and on alternative regulatory approaches.

We acknowledge that the proposed prescriptive separation distances for the storage of ammonium nitrate may have impacts on communities and industry. Through public consultation, we want to identify and understand concerns stakeholders may have about the regulation of ammonium nitrate facilities.

SafeWork NSW consulted with other key agencies responsible for the administration and enforcement of the Explosives Act and Regulation to develop this Discussion Paper. This included the NSW Resources Regulator, NSW Police Force, NSW Environment Protection Authority, NSW Fire and Rescue, and the NSW Department of Planning and Environment (DPE).

1.2. Benefits of the proposal

The proposal outlined in section 4 of this Discussion Paper would raise safety standards for ammonium nitrate facilities to a best-practice standard already used in other Australian jurisdictions. The proposal to apply the same standard of separation distances to ammonium nitrate for explosives and ANE in NSW would address the current gap in legislation. This would ensure that all substances under NSW explosives legislation are regulated consistently.

The main benefit of this proposal is safer conditions for communities in the area of existing or potential new ammonium nitrate facilities. This includes residential neighbourhoods, commercial buildings, health and aged care facilities, schools and childcare facilities, and vital public infrastructure. Quantity-based separation distances would protect vulnerable populations in the event of unforeseen events or failures in safety practices. If there is an explosion at an ammonium nitrate facility, separation distances would prevent widespread fatalities, injury, and property damage. It would also minimise economic disruption and the need for disaster recovery that is often needed after an ammonium nitrate explosion, as seen in other countries.

Separation distances also improve safety by eliminating hazards related to emergency management. If there is a fire involving ammonium nitrate at a facility without adequate separation, emergency services need to evacuate the surrounding area. It can be a resource and time intensive process. A facility with appropriate separation from the community has a built-in exclusion zone that precludes any evacuation or active emergency management. As a result, fewer, if any, police, fire and other emergency workers would be at risk of entering a dangerous environment. Separation distances would prevent other consequences of a wide-scale evacuation in a populated area. This includes traffic gridlock, interruption to business, and displacement of residents.

NSW industry would benefit from a more certain, transparent, and fair regulatory environment under the proposal. It removes the inconsistency of case-by-case assessments and lifts barriers that inhibit investment in NSW. Some national businesses already apply separation distances to their facilities as a matter of company policy, and the proposal would ensure there is no competitive advantage to less safe practices.

The proposal would enable SafeWork NSW and other government agencies to continue raising safety standards. It aims to meet community expectations and promote a culture of continuous improvement. Resources spent on complex assessments and planning for potential emergencies in populated areas, could go towards preventative compliance measures.

1.3. Acronyms and abbreviations used in the Discussion Paper

AEISG	Australian Explosives Industry Safety Group
AN	Ammonium Nitrate
ANE	Ammonium Nitrate Emulsion
ANE Code	AEISG Code of Practice - Storage and Handling of UN 3375
AS 2187	Australian Standard 2187.1-1998 - Explosives - Storage, transport and use. Part 1: Storage
AS 4326	Australian Standard 4326-2008 - The storage and handling of oxidizing agents
CAN	Calcium Ammonium Nitrate
MHF	Major Hazard Facility
IBC	Intermediate Bulk Container, usually in the form of a flexible bag holding 1 to 1.2 tonnes of ammonium nitrate. Also known as 'bulka bags'.
SSAN	Security Sensitive Ammonium Nitrate
SSDS	Security Sensitive Dangerous Substance
UN 1942	Solid Ammonium Nitrate classified according to the Australian Dangerous Goods Code in Division 5.1 and with proper shipping name AMMONIUM NITRATE, with not more than 0.2% total combustible material, including any organic substance calculated as carbon, to the exclusion of any other added substance.
UN 2067	Solid Ammonium Nitrate classified according to the Australian Dangerous Goods Code in Division 5.1 and with proper shipping name AMMONIUM NITRATE FERTILISER.
WHS	Work Health and Safety

1.4. Definitions used in the Discussion Paper

Explosive precursor:	A substance prescribed by clause 5 of the Explosives Regulation 2013 and used to manufacture explosives.
Security Sensitive Ammonium Nitrate (SSAN)	Defined by Schedule 1 of the Explosives Regulation 2013, as any ammonium nitrate or ANE product containing more than 45 per cent ammonium nitrate, excluding ammonium nitrate solutions. It includes Calcium Ammonium Nitrate.
On-site protected place	A building where people are employed within the property boundary of the installation, including offices, warehouses, manufacturing or processing areas, amenities and, generally, other dangerous goods stores where quantities exceed minor storage.
Protected Works Class A	Public street, road or thoroughfare, railway, navigable waterway, dock, wharf, pier or jetty, marketplace, public recreation and sports ground or other open place where the public is accustomed to assemble, open place of work in another occupancy, river-wall, seawall, reservoir, water main (above ground), radio or television transmitter, main electrical substation, private road which is the principal means of access to a church, chapel, college, school, hospital or factory.
Protected Works Class B	Dwelling house, public building, church, chapel, college, theatre, cinema or other building or structure where the public is accustomed to assemble, shop, factory, warehouse, store, building in which any person is employed in any trade or business, depot for the keeping of flammable or dangerous goods, major dam.
Vulnerable facility	Multistorey residences and businesses; large glass fronted buildings of high population; healthcare facilities, childcare facilities, schools; public buildings and structures of historical significance; major traffic terminals like railway stations and airports; and major public utilities like gas, water, and electrical works.

2. Background

2.1. Ammonium nitrate

Ammonium nitrate is a hazardous chemical which in most forms is classified as an oxidising agent. It does not burn itself but can support and promote the burning of other materials. When mixed with other substances or under some extreme conditions, ammonium nitrate can behave as an explosive. These properties warrant strict controls on storage and handling of ammonium nitrate and security of ammonium nitrate facilities.

Ammonium nitrate is manufactured, imported, transported, and used within NSW. The majority of the ammonium nitrate in NSW is used as an explosive in mining operations, and the remainder is used in agriculture as a fertiliser.

Ammonium nitrate is mostly handled in bags or in bulk, and may be stored in several ways, including:

- open air storage
- freight container storage
- dedicated building or area within a building
- silos or bins; and
- magazines for blasting explosives.

2.2. The NSW industry

There are two WHS Regulators in NSW, SafeWork NSW and the NSW Resources Regulator. The *Explosives Act* regulates the handling of explosives and explosive precursors in NSW, such as ammonium nitrate. The NSW Resources Regulator administers the explosives legislation at mining workplaces, and SafeWork NSW administers the explosives legislation in all other locations.

SafeWork NSW licensing records indicate that there are currently 37 non-mining sites licensed to store ammonium nitrate in NSW. Of these 37 sites, approximately 25 facilities including 8 Major Hazard Facilities would be subject to the proposal outlined in this Discussion Paper due to the quantity of ammonium nitrate they store.

2.3. Recent incidents

Although ammonium nitrate has a low likelihood of explosion, international incidents show that the consequences can be significant. In the last 10 years there have been major explosions involving ammonium nitrate at West, Texas (2013), Angellala Creek, Queensland (2014), Tianjin, China (2015) and Beirut, Lebanon (2020).

The 2020 Beirut explosion occurred in a warehouse at the port of Beirut. It resulted in at least 217 deaths and 7,000 injuries, and billions of dollars of damage to residential neighbourhoods, commercial buildings, and city infrastructure. The Beirut explosion led to community concern about the safety of NSW ammonium nitrate storage facilities.

The ammonium nitrate storage conditions in Beirut would not comply with requirements of AS 4326 or the Explosives Regulation, and therefore would not be permitted by SafeWork NSW. However, the Beirut explosion demonstrates the severe consequences of an ammonium nitrate explosion at a facility without sufficient separation from the community.

In February 2022, the NSW Civil and Administrative Tribunal (NCAT), found that SafeWork NSW is legally entitled, and even required, to consider separation distances when assessing the safety of ammonium nitrate storage facilities. NCAT stated that standardised and published separation requirements are "clearly the preferable outcome in terms of transparency and consistency across the industry".

The NSW Government takes the concerns of communities very seriously. This Discussion Paper is the first step in seeking industry and community feedback. We want to ensure that regulation of the storage of ammonium nitrate considers all relevant matters, including the economic and social impacts of any change in regulatory approach.

3. Current regulatory framework

3.1. Legislation – *Explosives Act* and Explosives Regulation

The *Explosives Act* regulates the handling of explosives and explosive precursors in NSW. Explosive precursors are chemicals that can be processed to make an explosive.

The purpose of the *Explosives Act* is to protect people and property from the harm that may arise from the use of explosives and explosive precursors. The *Explosives Act* does this by establishing a licensing framework which restricts access to explosives and explosive precursors to people who can safely handle them, and who hold a current security clearance. This framework is supported by the Explosives Regulation.

The Explosives Regulation makes mandatory several technical codes relating to the safe handling of explosive precursors:

- Australian Dangerous Goods Code for transport (ADG Code)
- Australian Standard 4326 – The storage and handling of oxidizing agents
- Storage and handling of UN 3375 published by AEISG (ANE Code).

The key technical code relating to the safe handling of ammonium nitrate in NSW is AS 4326. This standard provides guidance on the safe storage and handling of oxidizing agents. The standard includes a chapter on ammonium nitrate due to its prominence and unique hazards. AS 4326 mandates that the regulator must be consulted about separation distances between storage facilities and protected works, but it does not provide specific detail about acceptable distances. AS 4326 puts the responsibility on the regulator to determine the separation distances that apply to ammonium nitrate facilities.

3.2. Multi-agency management of ammonium nitrate

The rules governing the management of ammonium nitrate in NSW are overseen and enforced by a number of NSW Government agencies.

- SafeWork NSW, as the explosives regulator, manages and enforces compliance with safety and security provisions of the explosives legislation, including licensing requirements. SafeWork NSW looks at both on-site and off-site risks associated with ammonium nitrate. SafeWork NSW also administers Major Hazard Facility (MHF) licences under Work Health and Safety (WHS) legislation for facilities storing very large quantities of ammonium nitrate.
- The Department of Planning and Environment (DPE) and local councils have responsibilities regarding land use planning controls when assessing hazardous facilities.

- The Environment Protection Authority (**EPA**) regulates environmental, transport, and waste management requirements associated with ammonium nitrate. The EPA also licenses some facilities under the *Protection of the Environment Operations Act 1997*.
- Regional NSW (NSW Resources Regulator) administers explosives legislation at mining workplaces.
 - NSW Police Force makes a recommendation about whether an individual is a fit and proper person to have access to ammonium nitrate, and reviews and assesses security plans at licensed MHFs.
- Fire and Rescue NSW reviews and assesses emergency plans at licensed MHFs and facilities storing more than 50 tonnes of ammonium nitrate.
- The Port Authority of NSW administers the NSW legislation which controls the conditions under which Dangerous Goods are handled and/or kept in the operational areas of the commercial ports in NSW.

3.3. Other jurisdictions

Queensland and Western Australia have developed codes that regulate the safety and security of ammonium nitrate facilities. Compliance with these codes is considered in the licensing of facilities. Other Australian regulators also have regard to the Queensland and Western Australia codes in matters of ammonium nitrate licensing.

- Queensland applies its Information Bulletin 53 (IB53) - *Storage requirements for security sensitive ammonium nitrate (SSAN)*.
- Western Australia applies its *Code of Practice for Safe Storage of Solid Ammonium Nitrate, Fourth Edition*.

Australian explosives regulators may also refer to the document titled *GPG02 Good Practice Guide for the Safe Storage of Solid Technical Grade Ammonium Nitrate* published by SAFEX International, an industry association of international explosives and ammonium nitrate manufacturers.

The abovementioned documents prescribe quantity-based distances from ammonium nitrate to protected works. They provide more certainty than AS 4326, applied in NSW, which states that separation distances are recommended but provides no detail.

These prescriptive requirements have been in place for over 10 years in Queensland and Western Australia. Both the mining and explosives industries operate successfully with prescribed separation distances in those states.

4. Proposal to introduce separation distances

4.1. Prescriptive separation distances

The NSW Government is considering the introduction of prescriptive separation distance requirements for the storage of solid ammonium nitrate. These requirements would complement the existing requirements of AS 4326 in relation to site plans, emergency plans, and storage conditions. These requirements include ensuring that:

- the required controls are in place to prevent fire, shock or contamination of the ammonium nitrate
- there are no other chemicals or ignition sources within the ammonium nitrate storage area.

The NSW Government's proposal for prescriptive separation distances consists of several elements. First, it involves a method used to determine appropriate distances, which is based on existing standards for explosives and ammonium nitrate emulsion with an adjustment for the lower explosive power of ammonium nitrate. Those standards, which include AS 2187.1 and the AEISG ANE Code, are based on international testing and experience and are considered to reduce risk to an acceptable level. The method for calculating the separation distances is set out in detail below in section 4.2. Certain substances, quantities, and individuals would be exempt from the new requirements, as outlined in section 4.3.

Sections 4.4 and 4.5 set out in detail the distances that would apply in different circumstances and environments under the NSW Government's proposal, both on-site and off-site. On-site separation distances are the distances between:

- Ammonium nitrate stores and on-site protected places. On-site protected places are buildings where people are employed within the property boundary of the installation, including offices, warehouses, manufacturing or processing areas, amenities, and, generally, other dangerous goods stores where quantities exceed minor storage.
- Ammonium nitrate stores and other ammonium nitrate stores.
- Stacks of ammonium nitrate in packages such as bags and intermediate bulk containers (IBCs).
- Ammonium nitrate stores and stores of explosives or ammonium nitrate emulsion (ANE).

Off-site separation distances are those between stores of ammonium nitrate and:

- Vulnerable facilities. These are high population buildings such as multi-storey residences and businesses, public buildings of historical significance, buildings with occupancies that are

difficult to evacuate, major infrastructure such as railway stations and airports, and major public utilities such as gas, water, and electrical works.

- Protected Works Class A. This covers public streets, roads or thoroughfares, railways, navigable waterways, docks, wharfs, piers, jetties, marketplaces, public recreation or sports grounds, other open places where the public is accustomed to assemble, an open place of work in another occupancy, river-walls, sea-walls, reservoirs, water mains (above ground), radio or television transmitters, main electrical substations, and a private road which is the principal means of access to a church, chapel, college, school, hospital or factory.
- Protected Works Class B. This covers dwelling houses, public buildings, churches, chapels, colleges, theatres, cinemas or other buildings or structures where the public is accustomed to assemble, shops, factories, warehouses, stores, buildings in which any person is employed in any trade or business, depots for the keeping of flammable or dangerous goods, and major dams.

Section 4.6 below sets out requirements for prompt and effective evacuations in case of emergency.

It is important to note that under the proposal, the prescribed separation distances would apply both to new storage facilities and retrospectively to existing storage facilities. In section 4.7., the Discussion Paper considers and seeks feedback on how this would affect industry, and what measures could mitigate the impact of retrospectively applying prescriptive separation distances to existing facilities.

4.2. Application of separation distances

Separation distances would be set by measuring from the nearest point of the ammonium nitrate store to the nearest point of an exposed site. A store includes but is not limited to facilities such as warehouses, silos, concrete pads, piles, bunkers, magazines, and process buildings.

Areas such as transit stores, unloading areas, loaded vehicle parking areas, and debagging operations would be subject to the same separation distances as stores if they are in continual use. That is, it is usual to have ammonium nitrate in those areas.

Under the proposal, SafeWork NSW would strongly recommend that separation distances remain entirely within the boundary of the facility to maximise protection to neighbouring properties, simplify evacuation planning, and ensure flexibility of operations. Where separation distances extend beyond the boundary, licensing of the facility would be subject to achieving the required separation to current occupants of neighbouring properties, and any future developments in the neighbouring properties.

4.2.1. Method for calculating separation distances

The NSW Government's proposal calculates separation distances for ammonium nitrate by assigning it a TNT equivalence number. TNT (trinitrotoluene) is an explosive substance which is used as a reference point because it has been widely used and its explosive effects are well understood. The TNT equivalence is assigned by comparing the energy released during an explosion of a substance with the energy released by a TNT charge of similar shape and under similar conditions.

The proposal would be to use a TNT equivalence of 32 per cent for ammonium nitrate, which is consistent with other relevant sources. It is the same figure used currently for the licensing of major hazard facilities, by the Queensland code, and the COAG Ammonium Nitrate Guidance Note No. 4 - *Siting of New Facilities*.

Where ammonium nitrate, ANE, and explosives stores are not sufficiently separated from each other, the quantities in those stores would be aggregated to determine the applicable separation distance. Where multiple regulatory instruments may apply to the aggregated quantity, the instrument with the greatest distance would apply.

Under the proposal, SafeWork NSW would have discretion to make allowances for mounding ammonium nitrate stores to reduce separation distances consistent with guidance in AS 2187.1.

4.3. Exceptions

Under the proposal, mandatory separation distances would not apply to:

- Stored quantities of 1,200 kg or less of SSAN, whether held under licence or an exception in the Explosives Regulation.
- Calcium Ammonium Nitrate (CAN), Ammonium Nitrate Emulsion (ANE) or Ammonium Nitrate Solution (ANSOL), unless specified.

The Explosives Regulation and AS 4326 would, however, continue to apply to excepted quantities and SSAN substances.

4.4. On-site separation distances from ammonium nitrate

4.4.1. On-site protected places

Under the proposal, ammonium nitrate stores would be separated from on-site protected places and the site boundary by at least 15 metres, subject to:

- the facility being capable of detecting any fire involving ammonium nitrate at its inception, such as by the installation of a suitable automatic fire detection system, to enable prompt response and evacuation if necessary; and
- the on-site protected place not posing a fire risk to the ammonium nitrate store; and
- compliance with the proposed evacuation requirements, as described further below.

4.4.2. Separation from other ammonium nitrate stores

Separation between ammonium nitrate stores is an effective measure to prevent an explosion in one store from initiating an explosion in an adjacent store. The intention is to limit the consequences of an incident.

Under the proposal, ammonium nitrate stores would be separated from other ammonium nitrate stores by the distances outlined below. These separation distances would take precedence over the requirements of Table 9.3 in AS 4326, as the Australian Standard does not reflect current best practice.

Types of stores not described below would require special consideration by SafeWork NSW.

Separation between stacks – applies to the storage of ammonium nitrate in packages such as bags and IBCs.

Table 1. Separation distances between stacks of AN in packages or IBCs

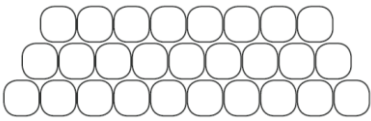
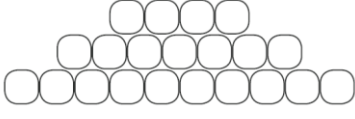
Stacking configuration	AN density ^(a)	Stack separation (m)
Normal configuration ^(b) 	Low	16 m
	Medium	9 m
	High	1 m
Pyramidal configuration ^(c) 	Low	9 m
	Medium	7 m
	High	1 m

Table notes:

(a) AN density is defined in the following ranges:

Low density AN: < 0.75g/cm³

Medium Density AN: 0.75 – 0.85 g/cm³

High density AN: 0.85 - .90 g/cm³ .

(b) Normal configuration is where each successive layer is set back 0.5 x IBC diameter from the layer below.

(c) Pyramidal configuration is where each successive layer is set back 1.5 x IBC diameter from the layer below.

Separation between piles – Section 9.5 of AS 4326 would continue to apply to the bulk storage of loose ammonium nitrate. Under the proposal, loose ammonium nitrate may be kept in piles if each pile does not exceed 500,000 kg and is separated by concrete walls of at least 200mm thick.

4.4.3. Separation from explosives and ammonium nitrate emulsion (ANE) stores

The proposal is for ammonium nitrate to be separated from explosives and ANE stores by the distances outlined in Table 2. Formulae are provided for calculation of distances that are not specified in the table.

Table 2. On-site separation distances from ammonium nitrate stores

Quantity of AN ^(a) (kg)	Distance to explosives stores ^(b) (m)	Distance to ANE stores ^(c) (m)
10,000	71	27
50,000	121	45
100,000	152	57
200,000	192	72
300,000	220	82
400,000	242	91
500,000	261	98

Table notes:

- (a) The quantity of ammonium nitrate in each undivided stack or pile. For example, a store divided into 500,000 kg stacks that are separated as required by this proposal shall have its separation distances calculated based on a single 500,000 kg stack.
- (b) The distance from an ammonium nitrate store to a store containing explosives: $D = 4.8 Q^{1/3}$, where Q is the quantity of AN (kg) x 32% for TNT equivalence.
- (c) The distance from an ammonium nitrate store to a store containing ANE: $D = 1.8 Q^{1/3}$, where Q is the quantity of AN (kg) x 32% for TNT equivalence.

4.5. Off-site separation distances from ammonium nitrate

Under the proposal, ammonium nitrate stores would be separated from off-site facilities by distances as outlined in Table 3. Formulae are provided for calculation of distances that apply to quantities not specified in the table.

Table 3. Off-site separation distances from ammonium nitrate stores

Quantity of AN ^(a) (kg)	Protected Works Class A ^(b) (m)	Protected Works Class B ^(c) (m)	Vulnerable Facilities ^(d) (m)
10,000	218	327	654
50,000	373	559	1119
100,000	470	705	1410
200,000	592	888	1776
300,000	678	1017	2033
400,000	746	1119	2238
500,000	803	1205	2410

Table notes:

- (a) The quantity of ammonium nitrate in each undivided stack or pile. For example, a store divided into 500,000 kg stacks that are separated as required by this proposal shall have its separation distances calculated based on a single 500,000 kg stack.
- (b) The distance from an ammonium nitrate store to a Protected Work Class A: $D = 14.8 Q^{1/3}$, where Q is the quantity of AN (kg) x 32% for TNT equivalence.
- (c) The distance from an ammonium nitrate store to a Protected Work Class B: $D = 22.2 Q^{1/3}$, where Q is the quantity of quantity of AN (kg) x 32% for TNT equivalence.
- (d) The distance from an ammonium nitrate store to a Vulnerable Facility: $D = 44.4 Q^{1/3}$, where Q is the quantity of AN (kg) x 32% for TNT equivalence.

4.6. Evacuation time requirements

Actively fighting fires involving ammonium nitrate is not recommended. The priority is to evacuate safely.

- Under the proposal, if prompt detection of a fire and evacuation of On-site Protected Places within the proposed required timeframe cannot be demonstrated, On-site Protected Places where workers are present would be considered Protected Works Class B for the purpose of determining separation distances.
- Under the proposal, facilities storing ammonium nitrate would be required to:
 - Document, implement and periodically test plans to evacuate the site and the surrounding area in case of an emergency involving ammonium nitrate.
 - Demonstrate that testing of the evacuation plan can evacuate all persons on and off-site in a Protected Works Class B distance within 45 minutes of the evacuation commencing. It is recommended that a target evacuation timeframe of 30 minutes be adopted.
 - Demonstrate that the evacuation plan specifies the conditions under which evacuation will commence. At a minimum, evacuation must commence when a fire begins to involve or impinge on ammonium nitrate.

- Consult with and request outside stakeholders to participate in the testing of the evacuation plan if evacuation requires assistance from outside stakeholders. That is. emergency services, local emergency management committees, or neighbouring property owners and occupants.

4.7. Impacts on industry

The NSW Government acknowledges that some businesses involved in ammonium nitrate storage may face challenges in complying with the prescriptive separation distances for ammonium nitrate if this proposal is implemented.

SafeWork NSW is seeking comment on strategies to mitigate the impact of the proposal, on the basis that the prescribed separation distances would apply retrospectively as well as prospectively.

On that basis, there are four categories of potentially affected sites in NSW:

- legacy (existing) sites that currently comply
- legacy sites that have capacity to comply if certain actions are implemented
- legacy sites that could not comply with the proposal
- future sites.

There are several ways in which the regulator could assist existing sites to comply with new separation distances. Identifying potential solutions to improve compliance and mitigate consequences of an explosion is critical. This could include:

- Allowing a transitional period for storage facilities which require additional time to comply with the new requirements.
- Providing an exemption, for a fixed period of time, to storage facilities who need time to upgrade their facilities to meet the proposed new requirements.

Other solutions which could be implemented to assist storage facilities to implement new separation distances:

- additional site controls such as subdividing and segregating ammonium nitrate stores
- rearranging storage sheds or stacks to create further distances
- reducing stored quantities to a level suitable for the available distances to protected works
- relocating to a more appropriate location with suitable separation from protected works
- fast-tracking licence assessments for new facilities.
- a combination of some, or all, of the above.

This paper is seeking feedback on whether there are additional controls that would enable a smooth transition to any new separation distance requirements. NSW Government is seeking evidence from industry of the:

- costs of any required upgrades to facilities
- costs if existing facilities were unable to comply
- estimates of the time that would be required for industry to comply with the proposal, if it were adopted.

4.8. Interaction with DPE safety planning legislation

SafeWork NSW has examined potential interactions between the proposal and DPE's existing land use planning requirements. No conflicts have been identified and it is anticipated prescribed separation distances for the storage of ammonium nitrate would improve land use and safety outcomes in NSW.

4.8.1. New solid ammonium nitrate storage sites

New developments storing solid ammonium nitrate (other than high density fertiliser grade ammonium nitrate on rural land for rural industry located at least 50m from site boundary) exceeding 5,000 kg would be considered potentially hazardous under *State Environmental Planning Policy No.33 – Hazardous and Offensive Development* (SEPP 33). To comply with SEPP 33, an application for such a development must include a preliminary hazard analysis (PHA). This must be prepared in accordance with DPE's *Hazardous Industry Planning Advisory Paper No. 6*, (HIPAP 6), showing that the development complies with the DPE's *Hazardous Industry Planning Advisory Paper No. 4, Risk Criteria for Land Use Safety Planning* (HIPAP 4).

From HIPAP 6, it is clear that any such development must be designed in accordance with AS 4326 as a starting point. AS 4326 states that for all ammonium nitrate stores, the separation distances to protected places and boundaries given by the relevant State and Territory apply.

If adopted, the separation distances in this Discussion Paper would apply for all new sites concurrent with, and regardless of, DPE requirements.

4.8.2. Existing solid ammonium nitrate storage sites

When DPE grants development consent with conditions, it expects the developer to obtain the necessary licences, permits and approvals (additional to the development consent), and to continually operate in a lawful manner.

For a development involving the storage of solid ammonium nitrate, this would include obtaining and maintaining a current explosives licence to comply with the *Explosives Act* as in force from time to time, even if this licence or Act are not explicitly referenced in the consent conditions.

This approach is consistent with sections 4.41 and 4.42 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), which lists the legislation that does not apply and the legislation that must be applied consistently when a consent is granted.

As the *Explosives Act* is not part of these lists, requirements under explosives legislation do not conflict with the planning consent. Operators of such facilities are expected to comply with all relevant requirements under all applicable legislation.

5. Discussion questions

1. Do you have concerns about the storage of ammonium nitrate in or around your local community? If yes, what are your concerns?
2. Does the proposal incorporate appropriate measures to manage the risks associated with the storage of ammonium nitrate?
3. How can ammonium nitrate storage facilities located near residential and commercial areas be made safer?
4. What will be the impacts on industry and the community if the NSW Government's proposal is adopted?
5. What is an appropriate transition period to provide to existing sites which may have difficulty complying with prescriptive separation distances? What other strategies should be considered to enable existing sites to comply with prescriptive separation distances?
6. What barriers are there for existing facilities moving or relocating ammonium nitrate stores within sites, to comply with prescriptive separation distances?
7. Are there any unintended consequences associated with the NSW Government's proposal, for industry and/or communities located within the vicinity of an ammonium nitrate storage facility?
8. Do you think the prescriptive separation distances will achieve the desired safety outcome?
9. Are there other costs that the proposal should consider, such as socio-economic costs?
10. What measures can be taken to offset the potential economic impact of some within the industry?
11. Do you have any further comments regarding the NSW Government's proposal and the storage of ammonium nitrate in NSW?

6. Making a submission

6.1. How to lodge your submission

Interested individuals and organisations are invited to make a submission on the Discussion Paper. Other matters covered by the *Explosives Act* or Regulation are not the subject of the consultation process.

We would prefer to receive your submission using the online options on the Have Your Say website, or by email in an 'accessible' format. Accessibility is about making documents more easily available to members of the public who have some form of impairment (visual, physical, cognitive). More information on how you can make your submission accessible is available on the WebAIM website at <http://webaim.org/techniques/word/>.

Submissions can be made by:

- Completing the online survey and/or uploading your written submission at the [NSW Government Have Your Say website](#).
- Emailing your written submission to: explosives@customerservice.nsw.gov.au
- Posting your written submission to: **Ammonium Nitrate Consultation**
Policy and Strategy, Better Regulation Division
NSW Department of Customer Service
92-100 Donnison Street
Gosford NSW 2250

The closing date for submissions is 5.00 pm on Thursday, 3 November 2022.

6.2. Next steps

Once the consultation period has closed, the feedback received will be analysed and assessed. If necessary, further consultation will take place. We will continue to engage and keep you updated on the progression of these reforms, including any transitional arrangements that may be implemented. If necessary, information about the progress of the Government's proposal will also be made available on the SafeWork NSW website, at www.safework.nsw.gov.au.

We will make all uploaded submissions publicly available on the Have Your Say website. If you do not want your personal details or part of your submission published, please state this clearly in your submission and tell us why. Automatically generated confidentiality statements are not sufficient. Submissions may be referred to in a report on the outcome of the consultation, however, any anonymous submissions will be referred to as such.

Please note, even if you state that you do not wish to publish certain information, we may need to release that information by law. For example, to comply with the *Government Information (Public Access) Act 2009*.