12

Teresa Gutteridge

From: Tim Cleminson [dunedinclaytarget@xtra.co.nz]
Sent: Monday, 12 December 2011 10:18
To: planning@dcc.govt.nz
Subject: Plan Change 13 - Hazardous Substances Online Submission

FROM Tim Cleminson

Tim Cleminson has made a submission to the "Plan Change 13 - Hazardous Substances via the online application form. Below are the details of the feedback.

Your details

- First name: Tim
- Last name: Cleminson
- Organisation: Dunedin Clay Target Club Inc
- Street address: Brighton Road
- Suburb: Waldronville
- Town / city: Dunedin
- Post code: 9018
- Email address: dunedinclaytarget@xtra.co.nz
- Day phone: 4709171
- Evening phone: 4640089

Your submission

- I Do/Do Not wish to be heard in support of this submission at the hearing: Do
- If others make a similar submission, I will consider presenting a joint case with them at a hearing: Yes
- The specific provisions of Proposed District Plan Change 13 that my submission relates to are:: We do not support the maximum allowable weight of 15kg of net explosive quantity (NEQ) proposed for storage of explosives classified class 1.4s Safety Ammunition in Plan Change number 13.
- My submission is that:: The maximum weight of 15kgs is less than the weight allowed under New Zealand legislation under the Hazardous Substances and New Organisms Act (HSNO) 1996, and we see no reason to have a reduced weight allowable. Our club currently operates at a level above the 15kgs and has done so for since 1962 at our present site. If however we were required to move to other grounds and re-establish ourselves, which has happened in the past, then we would be required to apply for consent to continue operation at our present levels.

  That the maximum allowable weight is set at 25kg of NEQ as per

- I seek the following decision from the Council:: section 6(6) of the Hazardous Substances and New Organisms Act (HSNO) 1996 as dictated by New Zealand wide legislation and as is adopted by other City Councils in New Zealand.
- Attachment: No file uploaded
- Attachment: No file uploaded

13

Teresa Gutteridge

From: Selwyn Smith [selwyn_smith@bnz.co.nz]
Sent: Monday, 12 December 2011 10:23
To: planning@dcc.govt.nz
Subject: Plan Change 13 - Hazardous Substances Online Submission

FROM Selwyn Smith

Selwyn Smith has made a submission to the "Plan Change 13 - Hazardous Substances via the online application form. Below are the details of the feedback.

Your details

- First name: Selwyn
- Last name: Smith
- Organisation:
- Street address: 10 Buckingham
- Suburb: St
- Town / city: Dunedin
- Post code: 9016
- Email address: selwyn_smith@bnz.co.nz
- Day phone: 03 4746452
- Evening phone: 03 4536222

Your submission

- I Do/Do Not wish to be heard in support of this submission at the hearing: Do
- If others make a similar submission, I will consider presenting a joint case with them at a hearing: Yes
- The specific provisions of Proposed District Plan Change 13 that my submission relates to are:: I oppose the specific provisions, and wish to see them amended. The proposed limits are far too low for competitve shooters and hunters alike. The serious shooters in our community will be adversely disadvanatged. The DCC needed to discuss this issue with the competition shooting sector in some detail before proposing limits. Basing a proposed decision on correspondence with shooting retailers is clearyl flawed. Only one retailing member does any competitive shooting from my understanding, and their knowledge of the 'serious' shooting community would be somewhat limited. The proposed limits will mean non-compliance from many shooters. 'Net weight' is a complex mechanism for determining an allowable limit, and I'm sure many shooters will be beyond the proposed levels at various times as the 'net weight' will vary from one cartridge to the next. How will this be enforced? It probably can't be enforced to any degree, and so some serious reconsideration needs to be given to increasing limits under

Plan Change 13

- My submission is that::

I wish to see the limits for general ratepayers increased to at least HSNO levels. There is no justification or Dunedin having a lower level than HSNO - particularly as there has never been an issue (read incident) with this in Otago, or NZ in my living memory. The inference that Dunedin will have lower emposed thresholds than the recognised national standard is that Dunedin is somehow at a higer risk than Wellington, Auckland etc. On the contrary, we have little in the way of high density housing, apartments etc. The risks would therefore be LOWER in Otago, and therefore levels set for Dunedin should generally be higher than the national standard.

- I seek the following decision from the Council::

To amend limits to at least HSNO levels. For those shooters who have been in excess of HSNO levels for many years, some clear allowance needs to be given to continue to allow them to hold such levels without resource consent ie existing use rights. I understand that this is an expensive process, and I would like to see a simplified (ie inexpensive) option available for shooters who can demonstrate existing use rights since 2004.

- Attachment: No file uploaded
- Attachment: No file uploaded

14

New Zealand Deerstalkers' Association Incorporated
Level 1, 45 – 51 Rugby Street, Mount Cook, Wellington 6021
PO Box 6514, Marion Square, Wellington 6141
Phone: 04 801 7367 | Fax: 04 801 7368
Email: deerstalkers@paradise.net.nz
www.deerstalkers.org.nz

Specific provisions of Proposed District Plan Change 13 to which the Association submission relates are:

Table 17.1 Explosives, p 17:38

This is in lieu of **SUBMISSION FORM 5,** cited under Clause 6 of the First Schedule of the Resource Management Act 1991, as being the prescribed form for making submission on publicly notified proposed **District Plan Change 13 – Hazardous Substances**

Introduction

The New Zealand Deerstalkers' Association Inc (NZDA) was formed in 1937 and its membership exceeds 10,000 in New Zealand and overseas. Branch members are active in New Zealand Land Search & Rescue Inc (LandSAR), firearm safety education, recreational hunting, among more than 55 branches distributed throughout New Zealand.

NZDA wishes only to submit on class 1 hazardous substances, in particular, to those of class 1.1D, 1.3C and 1.4S.

Support

NZDA supports **Table 17.1 as it deals with goods of class 1.3C, namely smokeless ammunition reloading powder in Group 1 zones.** The Association support arises because from the provisions of regulation 23 of the Hazardous Substances (Class 1 to 5 Controls) Amendment Regulations 2003 (SR 2003/177) (p. 125) (SR 2001/116).

Objections

1. NZDA objects to **Table 17.1 page 17:38 as it deals with goods of class 1.1D ('Gunpowder and blackpowder').** It is noted that the Hazardous Substances and New Organisms Act (1996) and subsequent regulations, allows up to 15 kg to be kept nationwide in residential areas.

   Accordingly, NZDA objects to this quantity, 5 kg, as proposed by Plan Change 13, is because it is only a third of what is allowed under Regulation 23 of the Hazardous Substances (Class 1 to 5 Controls) Amendment Regulations 2003 (SR 2003/177) (p. 125) (SR 2001/116).

   Further points to be made here are that gun (black) powder consumers tend to use more of the substance than users of more modern propellants do, this arising from the lesser efficiency (conversion of chemical energy into kinetic energy) of the older propellant. (This is one of the reasons smokeless propellants have become so much more widely used over the past 120 years). An outcome of this is that charges normally used in black powder firearms are approximately twice what those of more modern smokeless power firearms use, equating to approximately 5 grams (80 grains avoirdupois) per shot, instead of the more normal 2 to 3 grams (40 to 45 grains avoirdupois).

The involvement of cannon in various displays and celebrations requires greater quantities, requiring more stocks of gunpowder to be held by consumers of this class 1.1D product.

2 The Association would also **object** to **Table 17.1 page 17:38** as it deals with **goods of class 1.4S**, 'safety ammunition'.

Nada's objection to this part of proposed Plan Change 13 arises because it is only 40% of what is allowed under Regulation 23 of the Hazardous Substances (Class 1 to 5 Controls) Amendment Regulations 2003 (SR 2003/177) (p. 125) (SR 2001/116).

It is appreciated that the quantity allowed is an increase on what is currently permitted, but respectfully draw to your attention the writings of former US Army General Julian S Hatcher, whose 'Hatcher's Notebook' has long been recognised as a standard reference text on technical matters of this nature. Pages 531 to 540 are highly relevant.

Safety cartridges, commonly known as small arms ammunition, items of hazard class 1.4S, have long been recognised as products which will NOT mass explode, are NOT super-sensitive, and when exposed to fire, do not produce fragments beyond a maximum of 15 m (50 feet).

The quantity suggested by proposed Plan Change 13 perhaps coincidentally matches the quantity allowed on 'passenger service vehicles', and surely transportation is a more hazardous undertaking than mere storage of an already-recognisably safe good?

NZDA seeks the following decision from the council

- In connection with **provisions in Table 17.1 for goods of class 1.3C,** namely smokeless ammunition reloading powder in Group 1 zones, the Association would like the **council to retain the measures as proposed** by District Plan Change 13.
- In connection with **provisions in Table 17.1 page 17:38 for goods of class 1.1D ('Gunpowder and blackpowder'),** the Association would like the **Council to change the quantity lawfully able to be held by residents in Group 1 zones from 5 kg to 15 kg** in accord with the HSNO Regulations (2003).
- In connection with **provisions in Table 17.1 page 17:38 for goods of class 1.4S ('safety ammunition'),** the Association would like the **Council to change the quantity lawfully able to be held by residents in Group 1 zones from 15 kg to 25 kg** in accord with the HSNO Regulations (2003).

NZDA **does** wish to be heard in support of this submission.

The Association would consider presenting a joint case with like-minded others at a hearing.

Dianne Brown
Chief Executive Officer
New Zealand Deerstalkers' Association Inc

COLFO
COUNCIL OF LICENCED FIREARMS OWNERS INC.

New Council of Licensed Firearms Owners Incorporated
PO Box 24020
Manners Street
Wellington 6142
E: info@colfo.org.nz
W: colfo.org.nz

Specific provisions of Proposed District Plan Change 13 to which the Association submission relates are:

Table 17.1 Explosives, pages 17:38

This submission is on behalf of the New Council of Licensed Firearms Owners Incorporated (COLFO)

This is in lieu of **SUBMISSION FORM 5,** cited under Clause 6 of the First Schedule of the Resource Management Act 1991, as being the prescribed form for making submission on publicly notified proposed **District Plan Change 13 – Hazardous Substances**

Introduction

COLFO was set up in 1996 to lobby on behalf of firearm owners in New Zealand. It has successfully lobbied various governments since then on matters relating to firearms, ammunition and related products. Its current office is located in Wellington. It has also achieved roster status at the United Nations (UN). This status enables COLFO to have input into any legislation that the UN may seek to produce on the civilian ownership of firearms and ammunition. COLFO is also a member of the World Forum on Shooting Sports (WFSA). Members regularly travel overseas to address UN and WFSA meetings; this keeps us and our members fully updated globally on the matters that interest COLFO.

In respect of ammunition matters in New Zealand, COLFO had serious discussions with the old ERMA in 2001 – 2002 over the amount of ammunition that was allowed for private possession at home and for retailers of the product. The outcome of those discussions was that the limits at the time were set at 10 tonnes. Subsequent contact with the new RMA that has taken over ERMA's role in these matters now reveals that the quantity has now risen to 25,000 kg gross weight. See email following COLFO's submission^. These figures relate to amounts that activate requirements for a test certificate at the storage location.

It is well documented that safety ammunition class 1.4S UN 0012 is one of the safest products that people can possess. Certainly much safer than petrol, sugar, LPG and other house hold products. See attached email for trigger quantities that require a test certificate at a hazardous substance location. See also copies of relevant current DVD from Chicago fire department. These are being sent by courier separately. Since the advent of smokeless powder filled ammunition in New Zealand there is not one recorded case of a mass explosion or large scale fire caused by the storage of a large amount of class 1.4S safety ammunition. If I am wrong in terms of this statement, could the DCC produce documentary evidence to the contrary? ERMA could not in 2001. Looking at some other councils district plan in relation to hazardous substances it is interesting to note some don't even list the classification of 1.4S. Maybe because it is such a safe product.

COLFO believes that the proposed DCC storage quantities for class 1.4S safety ammunition will very negatively impact on all the shooting sports in the DCC area. The proposed requirements will impact the amount of ammunition that active shooters can store legally in their home and or business. This will result in more cost for those people because they will no longer be able to purchase ammunition in bulk at better prices, and will have to pay higher freight costs because of smaller shipments of ammunition from their suppliers. Also there will be additional travel costs, both in time and money with people having to make more trips to retailers to access ammunition. This will also apply to retailers. All firearm owners are already vetted by the New Zealand Police as fit and proper people, so as much as anyone can be are responsible and careful people, who are extremely unlikely to misuse ammunition.

Governments, and by default local councils can only govern successfully with the consent of the people they serve. If stupid and unnecessary and or draconian legislation is imposed on reasonable people, like licensed firearm owners the result is total contempt and often deliberate breaking of the law, is this the outcome the DCC wishes to achieve?

What non-existent problem is the DCC trying to fix by the introduction of new and unnecessary laws relating to the storage of small arms ammunition class 1.4S? They also potentially leave themselves open to lawsuits by affected parties. Is this what the citizens of Dunedin want in these hard economic times?

So in summary, as far as COLFO is concerned, the DCC has failed to substantiate their case in any meaningful way. We cannot see any benefits to the city of Dunedin or its people, beyond increased enforcement costs to the ratepayers, and encouraging normally law abiding people to break any new regulations in this area.

So firstly, we kindly ask the council not to pass these proposed bylaws in regard to the storage both commercial and private, of Safety Ammunition class 1.4S UN0012.

Secondly, to consult more widely and much earlier with interested stakeholders in these matters.

Thirdly, COLFO would like to ask for a public hearing on this issue, and I and other COLFO executive members will fly to Dunedin to present our case in person.

Paul L Clark
COLFO executive member.

^ Email from Karen Lau of EPA

Main regulations under HSNO that relate to storage of safety ammunition (Class 1.4S):
Hazardous Substances (Classes 1 to 5 Controls) Regulations 201
http://www.legislation.govt.nz/regulation/public/2001/0116/latest/DLM35395.html?search=ts_regulation_classes_resel&p=1&sr=1

I have copied out the relevant bit (which refers to location test certificate requirements for storage of Class 1).

Table 6 (Schedule 2)
Quantities of class 1 substances that activate requirements for a test certificate at a hazardous substance location, for a designated use zone, for a designated transfer zone, and for notification of transport — rr 26, 30, 32, 46, 51

Hazard classification	Quantities
1.1B, 1.2B, and 1.4B	5 kg
1.1 (other than 1.1B or 1.1C), 1.2, and 1.5	50 kg
1.1C and 1.3 (other than 1.3G)	100 kg
1.3G and 1.4 (other than 1.4S)	200 kg
1.4S	1 000 kg
Fireworks in hazard classifications 1.3G, 1.4G, and 1.4S that are controlled under the Hazardous Substances (Fireworks) Regulations 2001	10 000 kg (gross weight)
Safety ammunition including pre-primed cartridges and primers of class 1.4S	25 000 kg (gross weight)

- Schedule 2 table 6: substituted, on 28 August 2003, by regulation 23 of the Hazardous Substances (Classes 1 to 5 Controls) Amendment Regulations 2003 (SR 2003/177).

Other bit from the same regulation that refer to safety ammunition:

Reg 13 Class 1 substances generally to be under control of approved handlers

(1) Except as provided in subclauses (2) to (6), all class 1 substances in any quantity must be under the personal control of an approved handler.
(2) The following class 1 substances are not required to be under the personal control of an approved handler:
(a) safety ammunition, including pre-primed cartridges and primers, of class 1.4S:
(b) airbag initiators and seatbelt pretensioners of class 1.4G or 1.4S:
(c) cable cutters of class 1.4S (UN 0070):
(d) power device cartridges of class 1.4S (UN 0323):
(e) signal tubes or shock tubes of class 1.4S (UN 0349):
(f) cassette degradation devices of class 1.4S (UN 0432

Hope this helps. Feel free to contact me if you need further information on the regulations about safety ammo. My contact details are below.

Kind regards

Karen Lau
Compliance Advisor
HAZARDOUS SUBSTANCES
Environmental Protection Authority • EP House • 20 Customhouse Quay
PO Box 131 • Wellington 6140 • New Zealand • www.epa.govt.nz
Tel +64 4 916 2426 • Fax +64 4 914 0433 • DDI +64 4 918 4856

16.

Teresa Gutteridge

From: Adrienne [nzcta@xtra.co.nz]
Sent: Monday, 12 December 2011 13:47
To: planning@dcc.govt.nz
Subject: Submission from NZ Clay Target Association
Follow Up Flag: Follow up
Flag Status: Completed
Attachments: Dunedin Submission.pdf

Submission from NZ Clay Target Association Attached.

Adrienne Sears
Executive Officer

NEW ZEALAND CLAY TARGET ASSOCIATION INC.

PO Box 5355, Papanui,
Christchurch 8542
Phone (03) 352 8577
Fax (03) 352 0077
Email: nzcta@xtra.co.nz
Web Site: www.nzclaytarget.org.nz

This is in lieu of **SUBMISSION FORM 5,** cited under Clause 6 of the First Schedule of the Resource Management Act 1991, as being the prescribed form for making submission on publicly notified proposed **District Plan Change 13 – Hazardous Substances**

Adrienne Sears, Executive Officer. New Zealand Clay Target Association Inc.
PO Box 5355, Papanui, Christchurch 8542

Telephone: 03 352 8577 Fax: 03 352 0077
Email: nzcta@xtra.co.nz

We **do not** wish to be heard in support of this submission.
We would consider presenting a joint case with like-minded others at a hearing.

Specific provisions of Proposed District Plan Change 13 to which our submission relates are:

Table 17.1 Explosives, p 17:38

Our submission is that:

Introduction

Comments will be strictly limited to class 1 hazardous substances, in particular, to those of class 1.1D, 1.3C and 1.4S.

Support for:

The provisions in **Table 17.1, dealing with goods of class 1.3C, namely smokeless ammunition reloading powder in Group 1 zones.** Support this because this is in accord with the provisions of Regulation 23 of the Hazardous Substances (Class 1 to 5 Controls) Amendment Regulations 2003 (SR 2003/177)(SR 2001/116).

No objection to what is proposed for Group 2 zones, nor for Groups 3, 4, 5 and 7 zones but is surprised at the "No threshold" proposed for Group 6 zones.

Objections: there are two;

1. **Table 17.1 page 17:38 where it deals with goods of class 1.1D ("Gunpowder and blackpowder").** This hazard was considered by the Hazardous Substances and New Organisms Act (1996) and subsequent Regulations, being derived from nationwide consultation held in January 2001 before publication of the Regulations later in 2001.

Accordingly, the objection to this quantity, 5 kg, as proposed by Plan Change 13, is because it is only a third of what is allowed under Regulation 23 of the Hazardous Substances (Class 1 to 5 Controls) Amendment Regulations 2003 (SR 2003/177)(SR 2001/116).

2 **Objection** to **Table 17.1 page 17:38** as it deals with **goods of class 1.4S**, "safety ammunition".

Objection to this part of the proposed Plan Change 13, is because it is only 40% of what is allowed under Regulation 23 of the Hazardous Substances (Class 1 to 5 Controls) Amendment Regulations 2003 (SR 2003/177)(p. 125)(SR 2001/116).

It is appreciated that the quantity allowed is an increase on what is currently permitted (when taken in conjunction with that for class 1.3C explosives), but in support of this, would respectfully point to the following reference which is attached to the rear of this submission as an appendix:

1. SAAMI (und, but circa 2000), *Small Arms Ammunition – Properties & Recommendations for Storage and Handling.* Small Arms Ammunition Manufacturers' Institute, Newtown, CT, USA.

2. Hampton, H. (1977), Facts About Sporting Ammunition Fires, in *Fire Journal*, January 1977, pp 1 – 6, National Fire Protection Association, Quincy, MA, USA.

These references all indicate that safety cartridges, commonly known as small arms ammunition, items of hazard class 1.4S, have long been recognised as a product which will NOT mass explode, is NOT super-sensitive, and when exposed to fire, does not produce fragments beyond a maximum of 15 m (50 feet), these being of such small size as to be contained by cardboard cartons, as Hatcher (1962)(pp 539, 540) attests.

Closer exploration of some other territorial local authorities for their controls on hazardous goods reveals the following:

Central Otago District: as set by the Explosives Act (1957), and refers to EPA for further advice (email of 08DEC2011 from Felicity Couper refers).

Clutha District: all class 1 goods are at levels set by HSNO Act (1996) and Regulations, (telecon Forsyth/Brass of 1630/05DEC2011.)

Waitaki District:...tba

Queenstown Lakes District: advises that HSNO levels prevail (email of 08DEC2011 from Keri Harrison).

Other territorial local authority areas examined worked from the following provisions:

Christchurch City Council: all class 1 goods for residential areas are at levels set by HSNO Act (1996) and Regulations (telecom L Osmers 1010/05DEC2011).

New Plymouth District Council: all class 1 goods are at levels set by HSNO Act (1996) and Regulations.

Wellington City Council: all class 1 goods are at levels set by HSNO Act (1996) and Regulations.

We seek the following decision from the Council

- **Support for the provisions in Table 17.1 as it deals with goods of class 1.3C,** namely smokeless ammunition reloading powder in Group 1 zones, we would like the **Council to retain the measures as proposed** by District Plan Change 13.
- **Objects to Table 17.1 page 17:38 as it deals with goods of class 1.1D ("Gunpowder and blackpowder"), we** would like the **Council to change the quantity lawfully able to be held by residents in Group 1 zones from 5 kg to 15 kg** in accord with the HSNO Regulations (2003).
- **Objects to Table 17.1 page 17:38 as it deals with goods of class 1.4S ("safety ammunition"),** would like the **Council to change the quantity lawfully able to be held by residents in Group 1 zones from 15 kg to 25 kg** in accord with the HSNO Regulations (2003).

Signed: 

Dated: 12 December 2011

17

New Zealand Service Rifle Association Inc

P.O.Box 12-450,
Penrose,
Auckland.
NZSRA@xtra.co.nz

To Dunedin City Council
12th December 2011

This is a submission from the NZ Service Rifle Association to the proposed Plan Change 13 and this is in lieu of the Submission Form 5, cited under Clause 6 of the First Schedule of the Resource Management Act 1991 as the prescribed form for making submission on publicly notified Plan Change 13 – Hazardous Substances.

NZ Service Rifle Association is the national body for the sport of Service Rifle shooting in which participants use service-type centre-fire rifles to shoot at targets. This style involves up to 250 rounds of ammunition at a competition, and so Plan Change 13 may adversely affect our members. While the majority of our members are based in Auckland and Wellington we do have a number of members in the DCC area and region. They will be directly affected by the proposed changes and we are also deeply concerned that this will, if enacted as proposed, become applicable in other local authorities as is not unusual for such proposals.

Specifically we wish to comment on the changes proposed in Table 17.1 relating to:-

Support - Class 1.3C – smokeless powder for reloading ammunition. We support the plan as this complies with Regulation 23 of the Hazardous Substances Regulations which are force nationally and which have proved to be practical.

Object – Class 1.1D "Gunpowder and Blackpowder". While this is a highly flammable material the HSNO Act 1996 and the Regulation 23 mentioned above allows storage of 15 kgs but the plan change proposes only 5 kgs. While this does not affect our members per se (as we do not shoot black powder firearms) we point out that black powder used in muzzle-loading firearms cannot be stored in the form of ammunition (as smokeless powder can) and also is required in much larger quantities because of its relatively low power (e.g. the equivalent load of black powder might be 2-3 times the amount of smokeless powder used in a similar shot). We submit that the quantity allowed to be stored is increased from the proposed 5 kgs to 15 kgs in accordance with the national standard

Object – Class 1.4S – safety ammunition (loaded with smokeless powder of Class 1.3C. Loaded ammunition is recognised nationally and internationally as having quite low flammability and as not representing any sort of explosion hazard. Safety ammunition is so called because it is inherently safe (unless fired from a firearm of course). Smokeless ammunition placed accidentally or deliberately in a fire does not explode, nor does it contribute significantly to the fire. The HSNO Act and Regulation 23 recognise this in allowing storage of 25 kgs with no special precautions but the proposed plan change would reduce this to 15 kgs. Members of NZ Service Rifle Association often own and use several rifles of different calibres and do use

relatively large amounts of ammunition at one time. The only cost effective means of either reloading ammunition or purchasing it is in quite large quantities, so that any significant reduction in the amount allowed to be stored could seriously inconvenience our members and for this reason we submit that the quantity allowed to be stored is increased from the proposed 15 kgs back to 25 kgs in accordance with the national standard.

The quantities of hazardous materials allowed to be stored in various places under the HSNO Act of 1996 were determined in a very conservative manner and it is difficult to imagine any reason why Dunedin City Council would decide that their city is significantly more dangerous than anywhere else in New Zealand, or that whoever suggested these new limits is more expert in this area than the people who wrote the HSNO Act. While not resident in Dunedin we are not aware of any recent (or indeed historical) fire event which would lead to the supposition that storage of these materials represents a hazard. Preventing the common storage of very much larger quantities of a known highly flammable material – petrol - might be more effective.

In summary then, NZSRA can see no reason for any reduction over the already conservative levels in the HSNO Act and Regulation 23 and therefore submits -

1) The amount of Class 1.3C materials remain as proposed which complies with the Act and has been found to be a practicable level;

2) The amount of Class 1.1D materials be increased from the proposed 5 kgs to 15 kgs in accordance with the HSNO Act.

3) The amount of Class 1.4S materials be increased from the proposed 15 kgs to 25 kgs in accordance with the HSNO Act.

We wish to be represented at any hearing, in support of this submission.

Stuart Hayman
Secretary NZ Service Rifle Association
Telephone 09-233-4225
Email nzsra@xtra.co.nz

18

This is in lieu of **SUBMISSION FORM 5,** cited under Clause 6 of the First Schedule of the Resource Management Act 1991, as being the prescribed form for making submission on publicly notified proposed **District Plan Change 13 – Hazardous Substances**

From: Otago-Southland Firearm Owners Coalition

c/- 70 Evans Street

Opoho

DUNEDIN 9010

10DEC2011

Telephone: 03 473 8317 Fax: 03 473 1117

Email: forsyths@clear.net.nz

We **do** wish to be heard in support of this submission.

We would consider presenting a joint case with like-minded others at a hearing.

Specific provisions of Proposed District Plan Change 13 to which our submission relates are:

Table 17.1 Explosives, p 17:38

Our submission is that:

Introduction

The Otago-Southland Firearm Owners' Coalition was formed in the early 1990s and remains as an amalgam of Antique and Historical Arms Association branches, blackpowder shooting groups, Clay Target Clubs, Cowboy Action Shooting Groups, Deerstalkers' Association branches, Pistol clubs and clubs which practice competitive action shooting involving handgun, rifle and shotgun. Combined affiliates number approximately two thousand over the two provinces.

Comments will be strictly limited to class 1 hazardous substances, in particular, to those of class 1.1D, 1.3C and 1.4S.

Support for:

The provisions in **Table 17.1, dealing with goods of class 1.3C, namely smokeless ammunition reloading powder in Group 1 zones.** The Coalition supports this because this is in accord with the provisions of Regulation 23 of the Hazardous Substances (Class 1 to 5 Controls) Amendment Regulations 2003 (SR 2003/177)(SR 2001/116), issued under the auspices of the Hazardous Substances and New Organisms Act (1996).

18

Objections, of which there are two:

1. **Table 17.1 page 17:38 where it deals with goods of class 1.1D ("Gunpowder and blackpowder").** This hazard was considered by the Hazardous Substances and New Organisms Act (1996) and subsequent Regulations, being derived from nationwide consultation held in January 2001 before publication of the Regulations later in 2001.

Accordingly, the objection to this quantity, 5 kg, as proposed by Plan Change 13, is because it is only a third of what is allowed under Regulation 23 of the Hazardous Substances (Class 1 to 5 Controls) Amendment Regulations 2003 (SR 2003/177)(SR 2001/116).

The Coalition would draw to your attention the need which gun powder shooters have for a larger quantity, this deriving from (a) the generally larger charges used in their mainly muzzle-loading firearms (black powder is a less efficient propellant than smokeless powder), and (b) because most muzzle loading firearms require priming, as well as the main charges, and because these involve different gunpowders (usually segregated by particle grain size, sometimes by manufacturing brand as well). This was recognised by the then Environmental Risk Management Authority (ERMA), now known as EPA, during the consultative phase of the development of workable regulations early in 2001.

Furthermore, those who use muzzle loading and black powder cartridge breech-loading firearms require gunpowder propellants suited to those of each calibre, up to and including antique and replica cannon. This means that a range of powders, available only in 500 gram containers, would be required by those taking part, for example, in the Masters Games black powder shooting events.

Serious competitive gun powder shooters, some of whom have hailed from Otago and Southland, have needed for their training, to purchase their gun powder from the same lot, necessitating the acquisition of several containers of the same manufacturing lot and grade for each of their firearms.

2 **Objection to Table 17.1 page 17:38** as it deals with **goods of class 1.4S**, "safety ammunition",

Objection to this part of the proposed Plan Change 13, arise because it is only 40% of what is allowed under Regulation 23 of the Hazardous Substances (Class 1 to 5 Controls) Amendment Regulations 2003 (SR 2003/177)(p. 125)(SR 2001/116).

It is appreciated that the quantity allowed is an increase on what is currently permitted (when taken in conjunction with that for class 1.3C explosives), but in support of this, would respectfully point to the following references which is are believed to be already in the possession of our Council with another submission.

These include: (and are attached)

1. SAAMI (und, but circa 2000), *Small Arms Ammunition – Properties & Recommendations for Storage and Handling.* Small Arms Ammunition Manufacturers' Institute, Newtown, CT, USA.

2. Hampton, H. (1977), Facts About Sporting Ammunition Fires, in *Fire Journal*, January 1977, pp 1 – 6, National Fire Protection Association, Quincy, MA, USA.

These references all indicate that safety cartridges, commonly known as small arms ammunition, items of hazard class 1.4S, have long been recognised as a product which will NOT mass explode, are NOT super-sensitive, and when exposed to fire, do not produce fragments beyond a maximum of 15 m (50 feet), any being of such small size as to be contained by cardboard cartons, as Hatcher (1962) (pp 539, 540) attests.

It is known that neighbouring territorial local authorities control hazardous goods by reference to the requirements of EPA. These authorities include:

Central Otago District: as set by the Explosives Act (1957), and refers to EPA for further advice (email of 08DEC2011 from Felicity Couper refers).

Clutha District: all class 1 goods are at levels set by HSNO Act (1996) and Regulations, (telecon Forsyth/Brass of 1630/05DEC2011.)

Waitaki District:…to be advised.

Queenstown Lakes District: advises that HSNO levels prevail (email of 08DEC2011 from Keri Harrison).

Other territorial local authority areas examined worked from the following provisions:

Christchurch City Council: all class 1 goods for residential areas are at levels set by HSNO Act (1996) and Regulations (telecom L Osmers 1010/05DEC2011).

New Plymouth District Council: all class 1 goods are at levels set by HSNO Act (1996) and Regulations.

Wellington City Council: all class 1 goods are at levels set by HSNO Act (1996) and Regulations.

We seek the following decision from the Council:

☒ **Support for the provisions in Table 17.1 as it deals with goods of class 1.3C,** namely smokeless ammunition reloading powder in Group 1 zones, we would like the **Council to retain the measures as proposed** by District Plan Change 13.

☒ **Objects to Table 17.1 page 17:38 as it deals with goods of class 1.1D ("Gunpowder and blackpowder"), we** would like the **Council to change the quantity lawfully able to be held by residents in Group 1 zones from 5 kg to 15 kg** in accord with the HSNO Regulations (2003).

☒ **Objects to Table 17.1 page 17:38 as it deals with goods of class 1.4S ("safety ammunition"),** would like the **Council to change the quantity lawfully able to be held by residents in Group 1 zones from 15 kg to 25 kg** in accord with the HSNO Regulations (2003).

Signed: (C.I.M FORSYTH)

Dated: 11 DEC 2011

DCC PC #13

Attachment #1

18

SAAMI®

SPORTING ARMS AND AMMUNITION MANUFACTURERS' INSTITUTE, INC.
SINCE 1926

SMALL ARMS AMMUNITION

Properties & Recommendations for Storage & Handling

11 Mile Hill Road, Newtown, CT 06470-2359

This leaflet has been prepared by the Sporting Arms and Ammunition Manufacturers' Institute, based upon information currently available to it. It is furnished to interested persons as a courtesy and in the interests of safety. It is not intended to be comprehensive; it does not modify or replace safety suggestions, standards, or regulations made by designated authorities, public or private. It is subject to revisions as additional knowledge and experience are gained. SAAMI expressly disclaims any warranty, obligation, or liability whatsoever in connection with the information contained herein or its use.

These paragraphs are meant to give everyone concerned for the shipment, storage and handling of small arms ammunition certain basic and important facts about the properties of this widely distributed product. Such information should dispel some of the rumors and tales which persist regarding ammunition bulk safety. It also outlines recommended storage conditions, and reports the reactions of ammunition when exposed to fire or intense heat and rough or vigorous handling.

These statements and recommendations do not supersede local, state or federal regulations. Local authorities should be consulted regarding regulations on the storage, transportation, sale and handling of sporting ammunition in each specific community.

Properties of Small Arms Ammunition

All ammunition is carefully engineered and manufactured as an article of commerce. It has a specific use; if stored in a proper manner and used as intended in firearms in good condition and designed for the specific cartridge, the safety and satisfaction of the shooter should be assured.

Small arms ammunition is packed in cartons and cases as specified by the US Department of Transportation. These container designs were developed in the interest of safety in transportation, storage and marketing. Therefore, unapproved packaging should never be substituted.

Specific properties or characteristics of small arms ammunition of particular interest to shippers, warehouse operators, dealers and users are as follows:

- Stocks of small arms ammunition will NOT mass explode. That is to say, if one cartridge or shotshell in a carton or case is caused to fire, it will not cause other adjacent cartridges or shotshells or their packages to explode sympathetically or in a simultaneous manner. There are no limits imposed on packaged quantities of ammunition which may be shipped, warehoused or displayed in commercial establishments.

This fact recognizes the inherently safe, non-hazardous characteristics of such ammunition in public or private storage.

- Small arms ammunition is not a super-sensitive item. Packages of ammunition may be dropped from any height which the packages will physically withstand, and cartridges or shotshells therein will not fire due to the shock. Properly packaged small arms ammunition will withstand all the rough handling tests of commerce such as drop test, vibration tests, and rotating drum tests without individual cartridges or shotshells firing.

- Small arms ammunition, if discharged in the open without the support provided by a firearm's chamber or other close confinement, discharges inefficiently. The flights — more accurately "movement" — of projectiles or debris particles from such incidents are extremely limited in velocity, range and energy. The small primer cups or rimfire case fragments are the missiles of highest velocity in such occurrences. Specifically, bullets and shot charges, being heavier than shell or cartridge cases in most instances, are rarely projected away from the location at which the unchambered round of ammunition was caused to ignite and discharge. However, small particles of metal or plastic from the burst case and primer cups may be propelled for short distances (usually not over 50 feet) at velocities sufficient in some instances to cause injury or discomfort.

Insofar as the Sporting Arms and Ammunition Manufacturers' Institute has been able to determine, there have been no substantiated reports of serious or fatal injuries caused by the discharge of packaged or loose ammunition in handling or in fires, regardless of the quantity or type of cartridges or shotshells involved. SAAMI has no verified report of any fire fighter hurt by flying bullets or shot pellets in fires involving a sportsman's in-the-home personal supply of ammunition, a retail sporting goods store's stock, wholesaler's or distributor's sizable inventory, or an in-transit cargo of this product.

Handling and Storage of Ammunition

Small arms ammunition contains explosive ingredients: A percussion-sensitive primer mixture and a smokeless propellant. It should be treated with respect and care in all handling, transportation and storage.

Ammunition should be stored in the factory carton or package. The labeling and identification on the original container help to assure that future use will be in the gun for which the ammunition is intended.

Ammunition stored in the home, retail outlet or distributor's warehouse over extended periods in factory packaging, subject to the ordinary variations of temperature and humidity ranging from tropic to Arctic conditions, can be expected to perform satisfactorily and safely in the firearms for which it was intended if such firearms are in proper working order and condition. Extreme high temperatures (over 150° F) however, should be avoided.

Ammunition should not be immersed in water or exposed to any organic solvent, paint thinner, petroleum product, ammonia, etc. Such materials may penetrate a loaded round and reach the powder or primer; a deteriorating effect will result which may cause misfires or squib shots. The latter can result in a projectile's lodging in a gun barrel, the obstruction possibly causing serious damage or injury when another shot is fired.

Ideally, home storage of small arms ammunition is in a locked closet or cabinet out of the reach of children and uninformed or incompetent persons. Both guns and ammunition should be stored out of sight and reach of children and others not physically or mentally capable of giving them correct, proper use and respect.

Storing guns and ammunition in locked auto trunks may be convenient, or required by state or local law, during short periods when moving to and from the hunting field or target range. The possibilities of extremely high temperatures make it sensible to remove firearms and ammunition from vehicles following the trip. The passenger compartment of a closed car when exposed to the sun often develops an extreme high temperature and is thus not a desirable spot to leave ammunition.

While blank cartridges will not mass detonate if one in a box is caused to fire, the noise of firing outside a gun will be nearly as loud as in normal use and may be harmful to hearing.The blank's "explosion" may also be rather violent due to rapidly expanding gasses released during burning. Obviously, blank cartridges deserve the same respectful handling and careful storage as other ammunition.

Retail and wholesale stocks of ammunition, not required for display, should be stored in original outer cartons or boxes exactly as supplied by the factory. When placed on basement or warehouse floors subject to moisture it would be well to stack the cartons on pallets. In some locations police or public security regulations may prescribe the manner in which small arms ammunition stocks are displayed and the quantity that may be in sight. Check with local authorities. Packages of ammunition should not be placed in proximity to heavily trafficked aisles in the reach of children.

Small Arms Ammunition in a Fire

Although much has been written and rumored about the 4th-of-July characteristics and so-called havoc of ammunition in fires, it just isn't so. Members of fire fighting units are understandably uneasy when confronted by fires where ammunition is involved.

Several members of the Sporting Arms and Ammunition Manufacturers' Institute have undertaken extensive experiments to show what can be expected when ammunition is involved in a fire. These companies have also made careful investigations after such fires, which show that the missiles do not have sufficient energy to penetrate the garments and protective gear worn by fire fighters.

Tests also show that the whizzing sound heard in the vicinity of ammunition fires are caused by primers expelled from the burning cartridges. The "pops" and "bangs" are exploding primers; the propellant powders burn inefficiently and make little noise.

Metallic cartridges in a fire are difficult to sustain in a burning condition once the packing materials have been consumed due to the cooling effects of the metal parts and the relatively high ratio of metal weight to smokeless powder. Only a vigorous fire around metallic ammunition stocks will cause all cartridges to burn. Shotshell ammunition is difficult to ignite, but once ignited it will sustain its own burning due to the plastic or paper tubes (hulls).

Disposal of Unservicable Ammunition

Ammunition that has been in a structural fire, and has become wetted or scorched, or has been exposed to flood waters should never be returned to commercial sales channels or sold at salvage sales, since it could be rendered dangerous to the shooter by such exposure. It should be scrapped.

Never dispose of ammunition by burying it or dumping it in a waterway. It may be retrieved years later, fully "live," and pose dangers to children or uninformed persons.

Under most circumstances, unservicable ammunition may be scrapped by returning it to the manufacturer. Written permission should first be obtained from the Product Services Manager of the manufacturer before shipment is made. If the manufacturer is not known, contact SAAMI at the address listed on the cover of this brochure.

Know the Following
RECOMMENDATIONS ON STORAGE AND HANDLING
Issued by the National Fire Protection Association
Battery March Park, Quincy, MA 02269 and reprinted with their permission:

NFPA 495

Explosive Materials Code

Chapter 11
Small Arms Ammunition and Primers, Smokeless Propellants, and Black Powder Propellants

11-1 Basic Requirements.

11-1.1 In addition to all other applicable requirements of this code, intrastate transportation of small arms ammunition, small arms primers, smokeless propellants, and black powder shall comply with US Department of Transportation Hazardous Materials Regulations, 49 CFR, Parts 100-199.

11-1.2 This chapter applies to the channels of distribution of and to the users of small arms ammunition, small arms primers, smokeless propellants, and black powder.

11-1.3 This chapter does not apply to in-process storage and intra-plant transportation during manufacture.

11-1.4 This chapter applies to the transportation and storage of small arms ammunition and components.

11-1.5 This chapter does not apply to safety procedures in the use of small arms ammunition and components.

11-2 Small Arms Ammunition

11-2.1 No restrictions shall be imposed on transportation of small arms ammunition other than those imposed by the US Department of Transportation or by the presence of other hazardous materials.

11-2.2 No quantity limitations shall be imposed on the storage of small arms ammunition in warehouses, retail stores, and other occupancies other than those imposed by limitations of the storage facility and by public safety regulations.

11-2.3 Small arms ammunition shall be separated from materials classified by the US Department of Transportation as flammable liquids, flammable solids, and oxidizing materials by a distance of 15 ft (4.6 m) or by a fire partition having a fire resistance of at least 1 hour.

11-2.4 Small arms ammunition shall not be stored together with Division 1.1, Division 1.2, or Division 1.3 Explosives, except where the storage facility is suitable for the storage of explosive materials.

11-2.5* Small arms ammunition that has been exposed to fire or damaged by exposure to water shall not be returned to commercial channels for reasons of consumer safety. The manufacturer shall be contacted to obtain recommendations for disposal of damaged ammunition.

Firearms Safety Depends on You

1. Always Keep the Muzzle Pointed in a Safe Direction
This is the most basic gun safety rule. If everyone handled his firearm so carefully that the muzzle never pointed at something he didn't intend to shoot, there would be virtually no firearms accidents. It's as simple as that, and it's up to you.

2. Firearms Should Be Unloaded When Not in Use
Firearms should be loaded only when you are in the field or on the target range or shooting area, ready to shoot.

3. Don't Rely on Your Gun's Safety
The safety serves as a supplement to proper gun handling, but it is not a substitute for common sense. You should never handle a gun carelessly and assume that the gun won't fire just because the "safety is on."

4. Be Sure of Your Target and What Is Beyond It
Once a gun fires, you have given up all control over where the shot will go or what it will strike. Don't shoot unless you know exactly what your shot is going to strike.

5. Use Correct Ammunition
Improper or incorrect ammunition can destroy a gun and cause serious personal injury.

6. If Your Gun Fails to Fire When the Trigger Is Pulled, Handle with Care!
Occasionally, a cartridge may not fire when the trigger is pulled. If this occurs, keep the muzzle pointed in a safe direction. Keep your face away from the breech. Then, carefully open the action, unload the firearms, and dispose of the cartridge in a safe way.

7. Always Wear Eye and Ear Protection When Shooting
Exposure to shooting noise can damage hearing, and adequate vision protection is essential. Shooting glasses guard against twigs, falling shot, clay target chips, and the rare ruptured case or firearm malfunction.

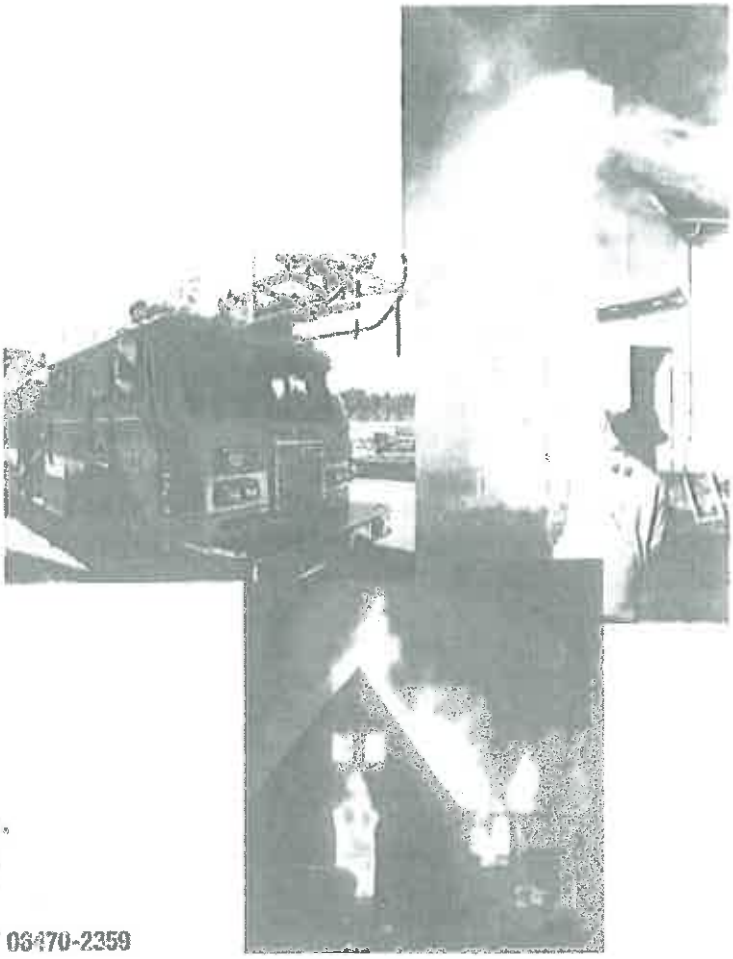
8. Be Sure the Barrel is Clear of Obstructions Before Shooting
Even a small bit of mud, snow, excess lubricating oil, or grease in the bore can cause dangerously increased pressures, causing the barrel to bulge or even burst on firing, which can cause injury to the shooter and bystanders.

9. Don't Alter or Modify Your Gun, and Have Guns Serviced Regularly
Do not jeopardize your safety or the safety of others by altering the trigger, safety, or other mechanism of any firearm or allowing unqualified persons to repair or modify them.

10. Learn the Mechanical and Handling Characteristics of The Firearms You are Using
Since guns can be so different, no person should handle any firearm without first having thoroughly familiarized himself with the particular type of firearm he is using, the safe gun handling rules for loading, unloading, carrying, handling that firearm, and the rules of safe gun handling in general.

Facts About Sporting Ammunition Fires

By Harry Hampton



SAAMI
11 Mile Hill Road • Newtown, CT 06470-2359

THE SPORTSMEN AND HUNTERS OF North America shoot billions of cartridges and shotshells with their firearms annually. To enjoy hunting, marksmanship competition, trap and skeet shooting, and other recreational activities involving lawful use of rifles, shotguns, and handguns, the sportsman-shooter must be able to purchase ammunition of the particular type needed for his gun and the sport that he is pursuing.

To supply his requirements for ammunition, a sizable distribution system is necessary to provide transportation, warehouse storage, and retail stocking of ammunition. Currently there are more than 450 different ammunition items that the shooter can buy, depending on his needs and preferences. This diversity obliges the channels of trade to carry a relatively large supply of ammunition to satisfy their customers' needs.

Is there a fire hazard posed by these large supplies of sporting ammunition in warehouses and retail stores? What, if any, danger do these stocks of ammunition pose to the public and to fire-fighting personnel in the event of a fire in these establishments? Should municipal fire prevention ordinances limit quantities of ammunition that may be stored in a single structure in the interest of public safety?

Experience and tests over the last half-century clearly demonstrate that sporting arms ammunition stocks do not constitute a fire hazard of any great significance. Cartridges are considerably less combustible than many retail items, including dry goods, wooden articles, oil and alkyd-base paints and their thinners, and aerosol preparations. The ignition point of ammunition is much higher than that of these items and most types of ammunition will not even maintain combustion if ignited. To burn them requires help from adjacent combustibles.

But what if the structure containing ammunition burns and the ammunition supplies burn along with it? Are the effects of such a fire similar to the effects of hundreds of shotguns and rifles discharged in all directions as fast as their triggers can be pulled? The answer is an emphatic NO!

Ammunition fired in the open, not enclosed in a gun's chamber, discharges with such inefficiency that the projectile will not even penetrate an ordinary fiberboard shipping container panel at very close range. When not strongly and tightly confined, smokeless propellant powders burn relatively slowly and do not explode as we know they do when fired in a gun. Pressure within a cartridge case must build up to several thousand pounds per square inch to cause the cartridge to discharge as it does in a gun. Unless it is tightly confined, as in a gun chamber, no ammunition shell case will withstand the growing pressure of gases generated by burning propellant powder without bursting before the bullet or shot is expelled with violence or velocity.

Newspaper accounts of fires in hardware and sporting goods stores often tell of "whizzing" bullets or ammunition flying from the store windows, spraying the area with a devastating barrage. Yet miraculously, no one is ever seriously wounded or killed by the spray of bullets and shot. The fact is that bullets and shot are not projected at velocities higher than you could throw them by hand. The whizzing sounds that are reported are, for the most part, primer cups being popped from shells. Because they are of relatively low mass, they have very little energy, short range, and practically no penetrating power.

In 1974, the City of Chicago contemplated a fire protection ordinance to limit severely the stores of sporting ammunition permitted in commercial establishments. Local wholesale and retail outlets challenged the proposal, and the Court asked the Fire Prevention Bureau to determine what degree of hazard is involved in a structural fire involving ammunition. The Sporting Arms and Ammunition Manufacturers' Institute (SAAMI) volunteered to help the Chicago Fire Prevention Bureau obtain factual data to present to the Court.

SAAMI technical experts met with Chicago Fire Prevention Bureau engineers and a test program was developed. A location for the

tests was selected on abandoned powder mill, property of the Olin Corporation's Winchester-Western Ammunition Works near East Alton, Illinois. The test program agreed upon is summarized as follows:

1. Burn a frame structure containing packed sporting ammunition and observe the effects of the burning ammunition on the overall intensity of the fire and judge as to hazards to personnel and adjacent property.
2. Burn packed ammunition in an open area to assess missile hazard.
3. Burn packed sporting ammunition in a fire-resistant structure that provides close confinement and determine if build-up of heat and pressure in the close confinement increases the rate and intensity of burning, or possibly causes mass explosion.
4. Subject packed ammunition to severe shock to determine if any cartridges in the packages will fire; in the event they do fire, do they cause other cartridges in the container to fire?

Ammunition for the experiments was supplied by the four ammunition manufacturers who are members of SAAMI. A total of 111 cases of sporting ammunition containing 145,500 rounds representing most of the popular types and brands of shotgun shells, rimfire cartridges, centerfire pistol or revolver cartridges, and centerfire rifle cartridges were consumed in the series of experiments. This ammunition contained approximately 272 pounds of smokeless propellant powder and 9.2 pounds of priming compositions.

The experimental program, conducted October 2, 1974, was witnessed by Chicago Fire Prevention Bureau personnel and fire chiefs from several other cities, representatives from SAAMI and each of the member companies participating, as well as from the NFPA and the local press.

Ammunition in a Burning Structure

An abandoned manufacturing building scheduled for demolition was used in this experiment. It was a solidly-built frame structure, 20-feet-by-24-feet, 1 ½ stories high on a concrete pad, of wood sheathing with tar paper exterior, and a steeply pitched asphalt shingle roof. There were fourteen 3-foot-by-6-foot wooden sash glass windows and a 15 foot ceiling. The ammunition listed below was stacked inside the building near the left-rear corner, on a wooden platform.

24 cases shotshells	12,000 rounds
12 cases centerfire rifle cartridges	12,000 rounds
4 cases centerfire pistol or revolver cartridges	8,000 rounds
7 cases 22 rimfire cartridges	35,000 rounds
47 cases	TOTAL: 67,000 rounds

A large quantity of scrap lumber and fiberboard packing materials was piled adjacent to and under this ammunition. Fuel oil was poured over some of the scrap lumber. Fire was initiated by an electric squib in a small sack of black powder placed in a small pile of smokeless powder near the oil-soaked wood.

Sounds of ammunition "popping" began approximately one minute after ignition, and the "popcorn popping" effect lasted for 20 minutes, at which time the building was almost completely consumed. Olin Fire Protection Department personnel extinguished the blaze at that time. They had been spraying the adjacent trees behind the building from a distance of approximately 35 feet to prevent spread of the fire to the timbered area.

Fire-fighting personnel were as close to the building as the heat would allow during the height of the fire, while the ammunition was popping. They could have extinguished the fire with water from hoses at the scene, if they had so desired. No missile problems were encountered. They wore standard fire-fighter's rubberized coats and knee-high rubber boots, and their faces were protected by plastic face shields that extended from their helmets.

After extinguishing the fire, the witnesses searched the surrounding area for missiles. They found some cartridge shells as far as 135 feet from the fire. During the fire it was evident that smoking primer cups and cartridge shells were individually being thrown from the fire in an arcing trajectory. There

was no audible evidence of ammunition exploding en masse during the fire. The din of the "popping" was quite loud from a distance of approximately 100 feet, where most of the observers stood. Relatively few projectiles (bullets) were observed or found at distances of more than 40 or 50 feet from the fire's site.

Open Burning of Ammunition to Assess Missile Effects

This experiment was conducted to determine the extent of missile projection and the penetration effects from a fire involving sporting ammunition.

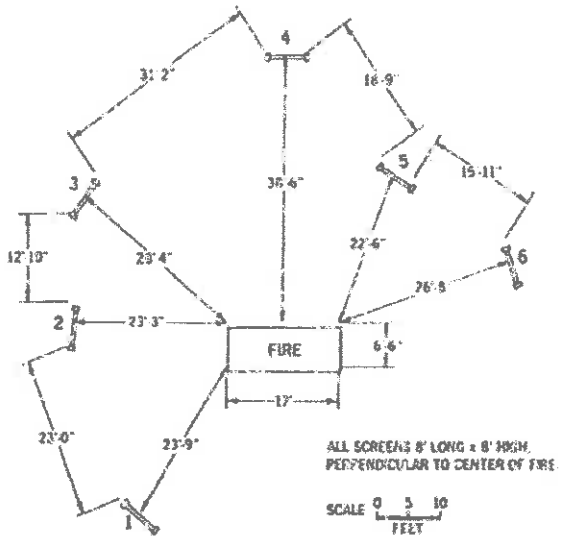
Cased ammunition was stacked on wooden pallets supported about three feet above ground level by concrete blocks. A large amount of oil-soaked scrap lumber was placed under and around the pallets to provide a hot fire. The area was flat and open, encircled on about half its perimeter by a wooded embankment 20 yards or more from the fire. The following stores of ammunition were consumed in this test:

22 cases shotshells	11,000 rounds
11 cases centerfire rifle cartridges	11,000 rounds
3 cases centerfire pistol or revolver cartridges	6,000 rounds
6 cases 22 rimfire cartridges	30,000 rounds
42 cases	TOTAL: 58,000 rounds

To assess missile effects from the fire, six witness screens were deployed at various distances, facing the fire in a semicircular arrangement. Eight-foot-square frames of two-by-fours were covered on one side by tent canvas (15.7 oz/yd.) with the backs covered by ¾ inch Cellotex® insulation board. The canvas simulated protective outer clothing ordinarily worn by fire service personnel. The insulation board was used to show by depth of penetration of the missiles the relative velocity or wounding power of projected missiles that might puncture the canvas.

After ignition by the same procedure used in the building-burning experiment, the fire proceeded rapidly and burned for 23 minutes, after which the smoldering remains were extinguished by Olin Fire Protection

Figure 1



Department personnel. Cartridges started popping one minute after ignition and popped steadily until the fire was extinguished. The popping created considerable din during the apex of the fire. Some observers standing about 150 feet away reported that a few missiles dropped in their vicinity, and at least one observer standing about 75 to 100 feet from the blaze said that he was hit harmlessly by a missile.

The witness screens were located at distances from the fire that varied from 22½ feet to 38½ feet, as shown in Figure 1.

After the fire subsided, the observers examined the witness screens. A more thorough assessment was made a few days later; the results are tabulated in Table 1.

Nearly all punctures of the canvas were made by primer cups. A few punctures were caused by small flying shards from ruptured cases of metallic cartridges. One "spitzer"-type small caliber bullet pierced the canvas and was "trapped" in the fabric. No other bullets penetrated the canvas or the Cellotex® boards. Penetration depths recorded in the boards and observation of the canvas punctures lead observers to the conclusion that no serious wounds would have been sustained by fire-fighting personnel struck by missiles

from a fire involving sporting ammunition at distances beyond 50 feet, if standard protective garments and face masks were worn. This observation is substantiated by the experience of sporting-ammunition manufacturers over the past half-century and more. It reflects precisely the industry's knowledge concerning fires involving military stores of small arms ammunition.

Table 1

Screen #1 23' 9" from fire center
Punctures in canvas upper half — 4
lower half — 6
Depth of penetration in Celotex® Max. 3/32"
Min. 1/16"

Screen #2 23' 3" from fire center
Punctures in canvas upper half — 6
lower half — 14
Depth of penetration in Celotex® Max. 3/32"
Min. 1/16"
Two large rifle primer cups and one small pistol primer cup stuck in the insulation board to a depth of 1/8".

Screen #3 28' 4" from fire center
Punctures in canvas upper half — 47
lower half — 25
Depth of penetration in Celotex® Max. 3/32"
Min. 1/16"
One shot shell primer cup stuck in the Celotex® which had penetrated to a depth of 3/32".

Screen #4 38' 6" from fire center
Punctures in canvas upper half — 6
lower half — 4
Depth of penetration in Celotex® Max. 3/32"
Min. 1/32"

Screen #5 22' 6" from fire center
Punctures in canvas upper half — 11
lower half — 7
Depth of penetration in Celotex® Max. 3/32"
Min. 1/32"
One shot shell primer cup and one small rifle primer cup stuck in the Celotex® to a depth of 3/32".

Screen #6 26' 8" from fire center
Punctures in canvas upper half — 35
lower half — 17
Depth of penetration in Celotex® Max. 1/4"
Min. 1/16"
Two shot shell primer cups and one large rifle primer cup stuck in Celotex® to depth of 3/32". One sliver of metal penetrated 1/4".

Burning Ammunition in Close Confinement

To simulate an ammunition fire in relatively close confinement, as might be encountered in a small basement storage room, a cubical concrete block structure six feet square and five feet high was constructed. A heavy steelmesh grille was supported by concrete blocks about two feet off the concrete floor. Cased ammunition was stacked on the grille. Oil-soaked scrap lumber beneath the grille provided a hot ignition fire.

Quarter-inch-thick flat boiler plates were placed over the top of the structure. One missing concrete block at the bottom-center of the structure provided necessary air draft to support combustion The leakage around the edges of the boiler plate "lid" provided the only exit for the products-of-combustion. The ammunition of various types and brands consumed in this test is listed below.

20 cases shotshells	10,000 rounds
3 cases centerfire rifle cartridges	3,000 rounds
3 cases centerfire pistol or revolver cartridges	6,000 rounds
3 cases 22 rimfire cartridges	15,000 rounds
29 cases	TOTAL: 34,000 rounds

Ignition was provided by the method used on the frame building. Cartridges started "popping" three minutes after ignition and continued a steady popping for 36 minutes. Dense gray smoke curled out of the structure, and "puffs" or minor gas explosions were observed, resulting from the ignition of accumulations of combustible gases above the fire in the relatively tight structure. The combustible gases were probably produced because insufficient air was provided to support complete oxidation of the combustibles. The heat of this fire was intense enough to cause the steel grille to collapse, and several small cracks developed in the mortar joints between some of the concrete blocks. Some missiles were projected from the fire through the opening at the bottom of the structure. A few of these were projected approximately 100 feet from the structure. There was no evidence of mass propagation of the ammunition in this fire.

Experiments of Severe Shock to Packed Ammunition

These experiments were conducted to determine the capabilities of packed ammunition to sustain severe shock without cartridges firing, and to determine if one shell firing in a container will "propagate" or cause others in the container to fire, which might cause mass explosion of the contents. Three types of experiments were conducted to investigate these phenomena: drop tests, rifle bullet impact tests, and firing a cartridge by remote control while it is in normal position within a container.

One case of 500 12-gauge shotshells, one case of 5,000 22-caliber long rifle rimfire cartridges, and one case of 1,000 30-30 centerfire rifle shells were raised in a derrick's clamshell to 30 feet above a concrete pad and dropped. The impact on the concrete caused the containers to break open and some of the contents to scatter, but no cartridges fired.

A much more severe experiment to determine the possibility of mass propagation was conducted by shooting highpower rifle bullets into cases of ammunition. One case each of 1,000 30-06 centerfire rifle cartridges, 500 12-gauge shotshells, and 5,000 22 long rifle rimfire cartridges were used in these experiments. 308 Winchester 150-grain soft point ammunition was fired from a rifle into each case at a range of 35 yards.

The case of rifle cartridges was struck twice, once on case-end center and again on case-end off-center. A puff of smoke was emitted from the case on each shot; on the second shot, a top flap of the case was jarred open. The bullet exits at opposite ends of the case produced a tear. Observers opening this case found that considerable damage was done to the, cartridges by the two expanding bullets, and that several cartridges within the shipping container had indeed fired, but there was no evidence of propagation — i.e., the discharge of one cartridge did not cause any of the adjacent rounds to fire.

The case of shotshells was hit three times on the case-end and on the side, a puff of smoke resulting on each impact. A corner of the case was torn off by the exit of one of the expanding bullets on the opposite end. Again, damage to the contents was extreme, caused by the expanding bullets' shock waves of energy. Several rounds within the case did fire, but again, there was no evidence of propagation.

The case of 22 long rifle rimfire cartridges was hit at the case-end centrally and again on the bottom. The exit of the bullets from the opposite side of the case produced a hole in the container about two inches square. Puffs of smoke were emitted on each impact. Inspection of the contents revealed considerable damage to the contents and several cartridges fired. There was no evidence of propagation.

A test criterion has been established for packed sporting ammunition by the United Nations Committee on Transport of Dangerous Goods. In order that the product may be classified as "safety explosives" and be transported without restriction as to quantity, it must meet a test whereby the firing of a single cartridge located centrally within the sealed shipping container results in total confinement of any explosion occurring within the container. The codes of this international body apply to international shipment of dangerous goods.

This test was performed on a case of shotshells, using electric ignition to fire shells located near the center of a regular case containing 500 rounds. Primers were specially prepared with a small hole in the center of the crown of each primer cup through which the priming charge was exposed. Shotshells were loaded with these special primers. Electric squibs were taped to each shell head so that on firing, the flash would impinge on the exposed priming mixture. This in turn fired the propellant powder in each shell.

Two shells so prepared were placed in a box of 25 shells in the normal position, with a regular shell between the two. The wires to the squibs were led out of the box through punctured holes in the inner case wall and through the top flaps of the case. The box was in the bottom layer, placed so that the test shells would be centrally located in the case. Nineteen more boxes of regular ammunition were packed and sealed to simulate a factory-

packed container (case) of shotshell ammunition ready for shipment.

When the electrically ignited squibs fired, there was a muffled report, and a puff of white smoke was observed. The case remained intact and was not punctured by explosion or debris from the firing. Examination of the contents showed that both shotshells had fired as they would be expected to fire without confinement in a gun chamber. No other shells had been caused to discharge by the two squib-ignited shells. Thus, the test would have qualified the commodity as "safety explosives" under the United Nations code.

Comments and Conclusions

1. This series of experiments confirmed the assertion that mass detonation of sporting ammunition in a fire is extremely unlikely, an assertion substantiated by all previous experience of the sporting ammunition industry. This characteristic results from the dilution effect of inert portions of sporting ammunition cartridges that separate the propellant and ignition charges into small increments, coupled with the fact that smokeless propellants burn relatively slowly and inefficiently at the low pressure levels generated before shell case failures occur. Even under extreme conditions of heat and confinement created in the close confinement burning test, there was no indication of either mass detonation or explosion.
2. Ammunition fires are noisy, generating the amplified sound of "popping corn." Confronted by such sound levels, fire protection personnel understandably could be unnerved if they were not accurately informed of the nature of the fire being fought.
3. Missile hazard is minimal even at relatively short distances from a fire involving sporting ammunition. The missiles of highest velocity are the primer cups which, because of their poor aerodynamic shape and light weight, lose velocity rapidly. At very close distances they could cause superficial flesh wounds. The heavier bullets, shot charges, and shell cases are not ejected from an ammunition fire at velocities sufficient to cause them to penetrate canvas screens within 25 feet of a fire.

It is obvious, however, that the face and exposed portions of the body must be protected. This protection is usually provided by face masks and protective clothing normally worn by fire protection personnel.

This article was prepared by the staff of the Sporting Arms and Ammunition Manufacturers' Institute based on the tests described, the present state of knowledge and experience, and observations in the industry that span four decades. It is being published in the interests of safety, but is not intended to be comprehensive or to modify or supersede safety suggestions, standards, or regulations made by competent authorities, public or private. The Institute expressly disclaims any warranty, obligation or liability whatsoever in connection with the information contained herein or its use.

It should be noted that the tests described in this article involved factory-loaded ammunition, manufactured by members of the Institute and packed in containers approved by the Department of Transportation. In none of the tests were separate stores of ammunition components such as primers, smokeless powder, and black powder present. Likewise, there were no stocks of other flammable or hazardous commodities ordinarily sold by hardware and sporting goods distributors, such as propane tanks, paints, solvents, thinners, and products in aerosol cans.

Chapter 11 of NFPA 495-1996, *Explosive Materials Code*, details recommendations that should be followed precisely for storage and handling of small arms ammunition, small arms primers, and propellant powders. As a matter of normal operating procedure, fire protection units are advised to acquaint themselves with the storage and sales facilities of distributors and retailers of these commodities.