OBSERVATIONS

by FITASC and ISSF/ESC,

Internationally recognized shooting sport organizations

on

ANNEX XV RESTRICTION REPORT

ECHA PROPOSAL FOR A RESTRICTION

released on 24th March 2021

on use #3 – clay target shooting sport

May 4th, 2021

Table des matières

The present document aims to clarify FITASC and ISSF (ESC) position and to comment the ECHA document named "ANNEX XV RESTRICTION REPORT – Lead in outdoor shooting and fishing". In the following, this will be referred to as "the ECHA document" or "the ECHA proposal".

This document follows previous studies carried out by the FITASC and ISSF/ESC and which were realized as a contribution to:

- the document named "Contribution of FITASC prior to ECHA's decision regarding a possible call for restrictions on the use of lead shot at clay target shooting ranges", dated July 17th, 2020;
- the related "Addendum by FITASC and ISSF/ESC, internationally recognized shooting sport organizations", dated 4th May 2021;

In the following, the ballistic studies previously realized will be referred to as "previous ballistic studies" or "previous studies".

1 May 2020 – ECHA Newsletter Issue 2

Around 21 000-27 000 tonnes of lead are estimated to be dispersed into the EU environment each year from the uses in the scope of the current investigation.

2 Page 9 (20 pdf) - Table2: Uses overview including annual releases to the environment, main risks identified and proposed restriction

In this table, the estimated releases to the environment due to the Outdoor sports shooting with gunshot is 35 000 tpa in 2020.

3 Page 68 (79 pdf) Table 1-11: Estimated amount of lead ammunition released (tons) in the EU in sports shooting per year

Excerpt: "In this table, the estimated releases in EU 27-2020 (tpa) due to the lead shot for sports shooting is 35 000 tpa."

4 Appendix B - Page 142 (159 pdf) - Amount of lead ammunition used on an annual basis in the EU 27-2020

Excerpt: "Based on information provided in the REACH registration Chemical Safety Report (CSR) for lead (2020) it can be assumed that on a typical outdoor pistol/rifle range and clay target range 5 000 kg/year and 10 000 kg/year of lead are used, respectively. A typical sporting clay target range (simulated game hunting) is assumed to use 10 000 kg/year of lead. On the contrary, a clay target area is assumed to use 390 kg/year".

5 Page 292 (303 pdf) 2.6.2.2. Environmental risk reduction and releases avoided to the environment

Excerpt: "The baseline is a release of 35 000 tonnes per year and 700 000 tonnes in 20 years (see section 1.8.2.1)."

6 Page 296 (307 pdf) - Table 2-34: Calculation of cost associated with ban on shot for sports shooting

Table 2-34: Calculation of cost associated with ban on shot for sports shooting

Parameter	Data
Volume of lead used per year	35 000 tons
Weight per cartridge	Based on FITASC contribution: 60 % of shooters use 28 gram cartridge, 40% of shooters use 24 gram cartridge. 60 % 28 gram and 40% 40 gram = 26.4 gram per cartridge on average
Number of cartridges	35 000 tonnes / 26.4 gram per cartridge = 1 326 million cartridges

7 Page 441 (424 pdf) - Table D.2-1: production volume of lead shot for sports shooting

D.2. Outdoor sports shooting with shot shell ammunition

D.2.1. Use volume

AEMS reported production volumes for sports shooting with shot Table D.2-1

Table D.2-1: production volume of lead shot for sports shooting

Use Nr	Ammunition type	Estimate of total units of ammunition (millions per year in the EU)	Estimation of total units of non-lead ammunition (millions)	Amont of lead used
3	Shotshells for sports shooting	350 - 650	40	12 000 -15 000

Information on the consumption of lead on and EU wide scale is scarce, earlier assessments from AMEC and COWI reported that the annual volume of use of sports shooting cartridges on EU wide scale is in the same order of magnitude as the annual volume of use for hunting.

The actual consumption of lead is estimated to be in the range of 35 000 tonnes per year (see main report).

Analysis of the points 1 to 7

ECHA asserts that « Based on information provided in the REACH registration Chemical Safety Report (CSR) for lead (2020) … A typical sporting clay target range (simulated game hunting) is assumed to use 10 000 kg/year of lead.": **WRONG**

ECHA has erroneously used the above figures, stemming from the CSR 2020 and provided by AFEMS. Below we quote AFEMS in the letter to FITASC dated 15th April 2021 (*See point 3 - Addendum to point 2.4.2 - Number of sports cartridges fired on European soil*):

"As a normal CSR, in fact, the dossier looks only at one worst-case scenarios based on one sample site for all possible exposure. It is the case of the estimations that ECHA erroneously cited in page 145 – Appendix B. As a matter of fact, these refer to worst-case releases at one local site. Since these are worst-case estimates, these should not be used for extrapolation to EU.

*To illustrate the worst-case character, sporting shooting at outdoor pistol rifle is 0.4-0.5 tpa (for one range with recycling). Literature refers to 0.04-0.8 tpa and to 10 tpa for clay target ranges. However, worst-case scenarios on one site should never be used for extrapolations, which are thus misleading and flawed. This is especially the case if we read the Annex, where ECHA states that "Based on information provided in the REACH registration Chemical Safety Report for lead (2020) in can be assumed that on a typical pistol/rifle range and clay shooting range […]". **The "typicality" of such figures is utterly incorrect. It will be in the first interest of AFEMS to highlight to ECHA the points above and the fact that the Agency should have used average releases per site or preferably EU sales statistics, as more reliable**."*

FITASC Estimates of annual lead releases (lead shot) due to clay target shooting sport:

-The European industry manufactures 1300 million cartridges in the EEA+UK, of which 60% are for hunting and 40% for sport shooting (*See point 3 - Addendum to 2.4.2 Number of sports cartridges fired on European soil*).

- Thus, 520 million sports cartridges are annually produced for the EEA+UK.

- The main manufacturing countries are Italy, France, Spain, the United Kingdom and Germany.

- 28 g sport cartridges (non-Olympic disciplines managed by FITASC) account for 60% of the market, and 24g sport cartridges (Olympic disciplines managed by ESC) 40% (*See point 3 - Addendum to 2.4.2 Number of sports cartridges fired on European soil*).

On the basis of above information, one can estimate the annual lead release due to clay target shooting sport at around 14 000 tons in EEA+UK:

# of sport cartridges	520 000 000,00		
Load of lead shot	Sports cartridge European Market repartition (%)	Number of cartridges	Lead ton
28,00	60%	312 000 000,00	8 736,00
24,00	40%	208 000 000,00	4 992,00
			13 728,00

Taking into account that:

- No significant producer of sport cartridges in the United States has exported to Europe, for many years, cartridges for the practice of clay shooting, rendered uncompetitive by transport (*See point 3 - Addendum to 2.4.2 - Number of sports cartridges fired on European soil*);

- Cartridge self-reloading is prohibited by ISSF and FITASC rules;

- there are 450 million clay targets sold annually in EEA+UK (*See point 4 - Addendum to 2 – 2.5 - European market of clay targets*).

Reasoning:

If the clay target sport shooting would cause 35 000tpa annual lead releases in the environment in the EU 27-2020 as claimed by ECHA, then it means that about 1,326 million of lead sport cartridges would be shot per year in EU 27-2020, as stated in table 2-34 in ECHA document:

Table 2-34: Calculation of cost associated with ban on shot for sports shooting

Parameter	Data
Volume of lead used per year	35 000 tons
Weight per cartridge	Based on FITASC contribution: 60 % of shooters use 28 gram cartridge, 40% of shooters use 24 gram cartridge. 60 % 28 gram and 40% 40 gram = 26.4 gram per cartridge on average
Number of cartridges	35 000 tonnes / 26.4 gram per cartridge = 1 326 million cartridges

If, according to ECHA, there were 1,326 million of lead sport cartridges shot per year in EU 27-2020, then:

- In **EU 27-2020** countries, the ratio would be **4.5 cartridges per clay target** for 291 million clay targets sold per year;

- In **EEA countries**, the ratio would be **4.4 cartridges per clay target** for 301 million clay targets sold per year;

- In **EEA countries + UK** the ratio would be **2.9 cartridges per clay target** for 451 million clay targets sold per year.

All above ratios are nonsensical as *(i)* it is impossible to shoot more than 2 cartridges per target with a double-barreled shotgun, and *(ii)* also according to the sport rules:

- for the 2 disciplines English Sporting and Skeet, the sports rules allow to shoot 1 cartridge per single target;

- for the 4 disciplines Olympic Trap, Universal Trench, Sporting and Compak Sporting: the sports rules allow to shoot 2 cartridges per single target.

Conclusions:

The most realistic figure to be used as baseline, is the one provided by AFEMS: 1300 million cartridges (including lead and steel) produced and sold in the EEA+UK, of which 60% are for hunting and 40% for sport shooting, thus 520 million sports cartridges are annually produced and used for the EEA+UK.

Not knowing the repartition lead/steel in these 520 million (*See email AFEMS dated 16th February 2021*), we use the highest estimate for lead cartridges at 520 million in EEA+UK. The highest estimated lead release in the environment by clay target sport shooting is then maximum 14 000 tpa in EEA+UK:

# of sport cartridges	520 000 000,00		
Load of lead shot	Sports cartridge European Market repartition (%)	Number of cartridges	Lead ton
28,00	60%	312 000 000,00	8 736,00
24,00	40%	208 000 000,00	4 992,00
			13 728,00

Moreover, the ratio between 520 million sport cartridges produced annually in EEA+UK and 451 million clay targets annually sold in EEA+UK is fully coherent with the different clay shooting sport rules:

520 / 451 = 1,2 cartridge per target.

In conclusion:

- the **WRONG** assertion by ECHA ("*A typical sporting clay target range (simulated game hunting) is assumed to use 10 000 kg/year of lead*") led to their fully erroneous overestimate by 35 000 tpa in EU 27-2020;

- using the **CORRECT** figure of 520 million sports cartridges annually produced in EEA+UK (*See point 3 - Addendum to 2.4.2 Number of sports cartridges fired on European soil*) gives the top estimate of annual lead releases in EEA+UK attributable to the lead shot for clay target sports shooting, to approximately 14 000 tpa.

8 Page 33 (44 pdf) 1.4.2. Manufacture of lead gunshot and bullets

Excerpt:

The production of lead gunshot and lead bullets is described in Annex A. For gunshot there are two main production processes: tower and Bleimeister. Bullets are made either via cutting or casting.

Lead gunshot is made in various sizes and placed on the market in cartridges of various load weights and gauges (cartridge diameter). Hunters and sports shooters select cartridges that fit

in their guns and are suited to the type of shooting undertaken. On average a lead sports shooting cartridge contains about 24 g of lead gunshot (fixed by International Sports Shooting Federation (ISSF) rules) and a hunting cartridge contains between 30 and 34 g depending on the number of individual gunshot pellets (load) and their size. The latter two (load and size) specifications allow hunters to select a cartridge that is suitable for the intended quarry. For further information see Annex D

9 Page 248 (265 pdf) C.1.1.2. Sports shooting

The evidence provided in the call for evidence concerning the use of alternative shot in clay target shooting is less clear than for hunting.

ISSF and FITASC rules requires the use of lead shot with a gauge not greater than 12 mm (usually 12 mm is used). Shotguns must be smooth bored. They are invariably 12-gauge, single-triggered and over-under type — one barrel is placed above the other.

They fire cartridges loaded with lead pellets: the weight of the pellet load must not exceed 24.5 grams per cartridge; the diameter of each pellet must not exceed 2.6 millimetres. Guns and cartridges are subject to official checks during the shooting programme.

Analysis of the points 8 and 9

1/ « On average a lead sports shooting cartridge contains about 24 g of lead gunshot (fixed by International Sports Shooting Federation (ISSF) rules)": **WRONG**

This assertion is in conflict with ECHA's table 2-34, where it is properly mentioned that, according to FITASC, 40% of clay target sport cartridges are loaded with 24gr of lead gunshot [for ISSF Olympic disciplines] and 60% with 28gr of lead shot [FITASC non-Olympic disciplines].

Here again ECHA fully overlooks the non-Olympic clay target sport shooting.

2/ "ISSF and FITASC rules requires the use of lead shot with a gauge not greater than 12 mm (usually 12 mm is used).": **WRONG**

ISSF and FITASC rules requires the use of lead shot with a gauge not greater than caliber 12.

3/ "They fire cartridges loaded with lead pellets: the weight of the pellet load must not exceed 24.5 grams per cartridge; the diameter of each pellet must not exceed 2.6 millimetres."

If the ISSF has defined the maximum of a shot diameter to 2.6mm, advisable for Olympic trap shooting, this only deals with lead shot and according to its ballistics properties. As we will see hereafter, the ballistic properties of the 2.6mm lead shot has nothing to do with the ones of the 2.6mm steel shot. Besides, the average pellet diameter used at ISSF disciplines turns out to be 2.4mm.

10 Page 35 (46 pdf) - RMM in the Chemical Safety Report (CSR)

Excerpt:

RMM in the Chemical Safety Report (CSR)

The REACH registration Chemical Safety Report (CSR) for lead provided in 2020 by the Lead Registrant, describes various professional and consumer uses of lead in ammunition.

Exposure Scenarios (ES) for these various uses of lead in ammunition are described, including an ES for the professional and consumer (non-military) use of lead ammunition, (service life). In this ES, the use of lead ammunition in sports shooting is covered, in relation to outdoor pistol/rifle shooting and clay target shooting (incl. sporting clays or simulated game hunting). The RMM identified in the CSR as "required" to prevent releases during service life at different types of shooting ranges are the following:

- *Measures to prevent rivers from crossing the lead deposition area*
- *Bullet containment in the shooting range: at least one or a combination of bullet traps, sand traps or steel traps*
- *Overhanging roof over the lead impact zone to prevent runoff*
- *Control of water runoff*
- *Lead shot deposition must be within the boundaries of the shooting range*
- *Remediation plan upon closure*

Specifically, the identified RMM are supposed to be applied according to the following Table 1-5. No information is provided in the CSR in relation to the expected specific effectiveness of each of the measures.

11 Page 52 (63 pdf) – table 1-7 Environmental effectiveness of different types of RMM applied in shooting ranges

Table 1-7: Environmental effectiveness of different types of RMM applied in shooting ranges

	Measure	effectiveness	Comment
Lead recovery	Wall and/or nets and/or soil coverage to recover shot	Effective	To achieve a high percentage of recovery, several measures might need to be in place
	Bullet trap	Very effective	Regular lead recovery: easy, cheap
	Backstop berm (with or without a cover) to trap bullets	Not effective	Often considered as a "safety" measure, specifically when no cover is present. No regular lead recovery possible; mechanical disturbance of the berm may increase soil contamination
Reduction of lead mobilisation	Lime amendment	Measures may contribute in some sites to reduce lead mobilisation but are not proved to be effective in natural soil systems in the long term to prevent lead migration	Adjustment of pH to reduce migration potential of lead
	Phosphate amendment[35]		Immobilisation of lead in natural soil systems may not be successful; it may have a negative impact on the environment (eutrophication). Expert advice is required
	Vegetation		Vegetation reduces mobilisation of lead but needs to be removed before or during lead recovery
Surface water (runoff) control	Such as: - Filter beds - Containment traps and detention ponds - Dams and dikes - Ground contouring	Effective	Especially in clay target ranges where lead recovery is performed once a year or less, expert advice is required on the most appropriate measure(s) required to control and clean surface (runoff) water
Groundwater control	Measurements of leaching water or groundwater	Effective	Especially relevant for older shooting ranges with heavy soil contamination and located in water sensitive areas or with specific soil conditions (easily leaching to groundwater); if leaching water or groundwater measurements show levels above the national threshold, remediation of the soil is required
Remediation	remediation	Effective	Remediation is very expensive.

It should be noted that shooting ranges (at which lead shot or bullets are used), even if all required environmental RMMs are implemented, should not be located in sensitive areas[36].

[36] *Water sensitive areas are for example wetlands, areas adjacent to surface waters, biosphere reserves, landscape, nature conservation, medicinal spring and drinking water protection areas, areas with rare or valuable soils and areas whose soils have pH values less than 4 or greater than 9. The use of lead gunshot in or around wetlands will be restricted based on Commission Regulation (EU) 2021/57 of 25 January 2021.*

Analysis of the points 10 and 11

In table 1-7, ECHA claims that « Measures may contribute in some sites to reduce lead mobilization but are not proved to be effective in natural soil systems in the long term to prevent lead migration": **WRONG**

Below the analysis by Ph.D. Jean-Louis SEVEQUE, Hydrogeochemist, Independent environmental expert and Court expert (*See point 25 - Addendum to 7.4 – 7.4.1.2 Specifications on liming (controlling lead mobility by increasing pH)*):

"As a conclusion, to hope to improve the structure of a soil without aggravating the lead mobility, the good compromise consists to maintain the water pH above to 6.5. This can be achieved over the years.

Implementation of lead management at the international level, via a charter for example, will obviously depend on the characteristics of the soils of the shooting ranges, but this can be achieved without putting a ban on lead from materials used in shooting ranges".

Conclusion

ECHA is obviously wrong as demonstrated by ARVALIS recommendations (*See point 24 - Addendum to 7.4 – 7.4.1.1 Characterizing the level of acidity of a plot and define the contributions of amendments to remedy it*), even if initially, the use of lime is mainly for cultivated soils. But it is thus demonstrated that these techniques, in particular liming, are not only applicable only for cultivated soils but can also, in the case of the regulation of the soil pH of shooting ranges soils, be repeated, as long as required, and are therefore effective in the long term in preventing lead migration.

On grounds with soil with pH naturally superior to 6.5, it has been demonstrated in all our previous studies that there is no risk of chemical migration of the lead. Consequently, there is no obligation to recover lead shot every year.

However, on grounds with pH soil naturally inferior to 6.5, it is sufficient to treat the soil to raise the pH (at a frequency to be determined) and thus neutralize the chemical mobility of lead.

Consequently, there is no rush to collect the lead since it is neutralized. One can wait the necessary time so that the lead quantity to be recovered be sufficient in quantity to self-finance its recovery. In that case, there is no cost for the shooting range.

12 Page 37 (48 pdf) - RMMs to recover lead gunshot

Excerpt

"RMMs to recover lead gunshot

Lead shot recovery from natural soil and agricultural land requires removal of the impacted soil horizon and is not feasible in forests. Therefore, specific means are required to be able to recover lead shot effective and periodically."

13 Page 41 (52 pdf) - Range layout to optimize lead recovery

Excerpt 1:

"Such measures can be applied to trap and skeet ranges but may not be suitable for all shooting range layouts such as in "sporting" shotgun disciplines.

With regards to lead shot recovery, the following specific information was submitted by several stakeholders:

• For shotgun ranges that do not have structures for the collection of lead shot in place, recovering and recycling is more difficult; if it would be done in shooting range that is in operation, the investments needed in the required infrastructure would be significant. Therefore, the recovering is done at the shooting range only when the operation ceases or in the case the pollutant risk level is assessed to be too high (Finnish Sport shooting association)."

Analysis of the points 12 and 13 excerpt 1

1/ ECHA claims that « *Lead shot recovery from natural soil and agricultural land requires removal of the impacted soil horizon and is not feasible in forests*.": **WRONG**

Lead recovery is feasible with manual interventions in wooded areas, rocky or sloping areas, even on podzolic soils. Companies specialized in lead recovery do have many means to do their job on sporting layouts, such of the company Plomb & Ecologic operating in various countries in EU (*See point 27 - Addendum to 7.7 – 7.7.1 Techniques for collecting lead pellets on sport installations / Example of a specialized company it*).

2/ ECHA quoted the following SSSF assertion "*For shotgun ranges that do not have structures for the collection of lead shot in place, recovering and recycling is more difficult; if it would be done in a shooting range that is in operation, the investments needed in the required infrastructure would be significant*.": **WRONG**

The case of the Finnish federation must not be extrapolated to the whole EU countries.

Firstly, the example the company Plomb & Ecologic shows that several economic models may be used *(see section7.7.1.2 Types of contracts)*.

Regarding podzolic soils:

Below the excerpt of the analysis by Ph.D. Jean-Louis SEVEQUE, Hydrogeochemist, Independent environmental expert and Court expert, quoted hereafter *(See point 28 - Addendum to 7.7. – 7.7.2. Lead pellet collecting on podzolic soils)*:

"The company Plomb & Ecologic made lead collect intervention at the shooting range named Ychoux in the "Landes" at the south-west of Bordeaux, where the soil is podzolic *(See point 7.7.1.4.2.6 Example of lead collect on podzolic soil)*. The extraction and screening of lead shot, accumulated both on the surface and in the ground, is extracted using manual and / or mechanical equipment. It is then passed through special screening and purification equipment which separates it from the soil elements through a filtration process. No elimination of the upper organic layer. At the end of the intervention, the soil is put back in place evenly. All work is carried out in situ, no earth movement is carried out outside the firing facilities. Once the operations are completed, and the soil filtered, the terrain will be visually embellished.

On the pictures (see above section 7.7.1.4.2.6), one can see that the ferns have grown back quite normally one year later. This information, Plomb & Ecologic was able to observe it on other sites and even sometimes even before their departure, when they intervene in different areas in the same shooting range. In other word, lead collection over podzolic soils do not required the total destruction of the vegetation and organic

layer, and vegetation went back normally, causing a natural bonding ability restoration if required.

And, as ultimate situation, as IFFS suggested, if the podzol horizons would be destroyed (we don't know how but let's be crazy why not), there is another horizon below, named coloured BP horizon, which is an accumulation of organic and mineral compounds above the non-carbonate bedrock. Coloured BP horizon is also a natural bonding layer able to stop lead migration. Therefore, podzol soils are not a limitation for lead recovery."

FSSF said: "*if lead recovery in podzolic area would be done in shooting range that is in operation, the investments needed in the required infrastructure would be significant. The recovering is done at the shooting range only after the final shut down of a range*." We just made the demonstration that this predication is totally false, that the different economic models proposed and a manual interventions of lead recovery are possible on podzolic soils.

Excerpt 2:

"FITASC suggested that lead recovery may be mandatory at the time of closure for shooting ranges that are shutting down and recommended the use of techniques to stabilise lead to reduce its potential to migrate."

Analysis of the point 13 excerpt 2

ECHA claims that "FITASC suggested that lead recovery may be mandatory at the time of closure for shooting ranges that are shutting down": **TRUE BUT UNCOMPLETE.**

On page 74 of the contribution document issued in July 2020, the exact FITASC proposal is (*See section 7.7 Methods of recovering lead for recycling, and their frequency*):

"As long as the correct techniques are used to stabilize lead and prevent it from migrating, shooting ranges have a reasonable period of time to recover it. It is, for instance, possible:

- To wait until the quantity of lead deposited on the land is sufficient to finance its collection through its residual value;

- Or to recover it only every ten years when quantities are small (small shooting ranges).

Furthermore, lead recovery may be mandatory at the time of closure for shooting ranges that are shutting down."

14 Page 72 (83 pdf) 1.5.3.4. Likelihood of primary ingestion of gunshot and fishing tackle by birds (uses 1,3,7)

Excerpt:

"Lead shot ingestion may also occur in the terrestrial environment from shot ingested in areas/ranges where sports shooting is practiced[55]. However, shooting ranges may have different level of attractiveness to birds depending on their specific location. […]

[55]: Ingestion of lead shot in wetlands was assessed in the restriction proposal on the use of lead shot in wetlands. Available data does not allow to assess the specific exposure arising from this "point source" in the terrestrial environment."

Analysis of the point 14

ECHA states that: "However, shooting ranges may have different level of attractiveness to birds depending on their specific location": **WRONG**

The fact is that shooting ranges are repulsive places for birds, due to the noise generated by thousands of shots fired daily.

15 Page 84 (95 pdf) 1.5.3.5. Likelihood of secondary ingestion of shot, bullets and fishing tackle by birds: overview (uses 1,2,3,7)

Analysis of the point 15

All considerations in point 1.5.3.5 may be TRUE as far as hunting shot/bullet are concerned, but they are **WRONG** as far as clay target sport shooting is concerned (use #3): the likelihood of secondary ingestion of shot is very weak at clay target shooting ranges which are neither protected natural zones, nor hunting zones.

Hereafter the analysis of point 15 by Ph.D. Jean-Louis SEVEQUE, Hydrogeochemist, Independent environmental expert and Court expert:

"*Once again, is not applicable for to sport shooting but for the hunt. And it is already mentioned in the text: "The likelihood of secondary ingestion of ammunition or fishing related lead is a combination of the feeding behavior and anthropogenic factors that influence the distribution of lead.". On a shooting range, there are no (at least opportunistic) carnivores which consume the flesh of other animals at some rate, and which may be exposed to lead from ammunition and fishing tackle via secondary ingestion.*

Shooting range is not a protected natural zone with species like carnivore eating the flesh on hunted prey. And as mentioned in table 1-17, the avian species took into account are scavengers and bird families like Laridae, Corvidae or Falconidae do not live in the area of a shooting range, mainly due to the noise. Have you ever seen a vulture close to a shooting range, waiting for the death of a pigeon?

As a summary, all the arguments presented by ECHA are probably true, but only for hunting, garbage collector, secondary lead ingestion, etc. but not at all for sport shooting with gunshot."

16 Pages 79-88 (96-105 pdf) of annex of annex XV restriction report: B.4.2.1.1 "Lead shot with overlying steel shot" and "Steel shot in surface soil"

Excerpt:

"The conclusions made by FITASC (2020) regarding iron driven soil acidification and subsequent mobilisation of lead appear to be underpinned by a single study in water (Hurley, 2004), in which conditions in the soil compartment were not explicitly considered. Given the pH buffering capacity of soils and their ability to precipitate metal ions, the Dossier Submitter considers the specific claim of acidification made by FITASC (2020) to be not scientifically grounded. Field evidence available to the Dossier Submitter is reported in the following paragraph."

Analysis of the point 16

Echa claims that "the Dossier Submitter considers the specific claim of acidification made by FITASC (2020) to be not scientifically grounded": **WRONG**

For the analysis of the above points 16:

1/ the analysis by Ph.D. Peter HURLEY (B.Sc(hons), Ph.D, MBA, C.Sci, CChem, FRSC, C.Env, C.WEM, MCIWEM, AFIChemE, Managing Director at Cylenchar Limited) (*See at Point 11 – Addendum to 5 – 5.1 Sporting steel shot over sporting lead shot – Facilited transport*);

2/ the study carried out throughout 2020 – 2021 by the geologic department of the Lomonossov State University of Moscow (*See at Point 12 - Addendum to 5 – 5.2 Study of steel shot transformation and assessment of environmental risks associated with steel shot use*);

3/ the analysis by Dr Jean-Louis Sévêque, Hydrogeochemist, Independent environmental expert and Court Expert (*See at Point 13 – Addendum to 5 - 5.3 Steel cannot be used for lead depollution*).

17 Page 303 (314 pdf) - 2.6.2. Cost and other economic impact / Shooting areas where steel is used (Baseline)

Baseline

A few Member States have implemented legislation that restricts the use of lead at shooting ranges. In Sweden, Norway and Denmark the use of lead shot in shooting ranges is banned in the entire territory (with some derogations in place; see below); in the Netherlands the use of lead shot is banned for clay pigeon shooting. In Belgium, in the Flemish region, there is a regional ban for the entire territory.

Impact

No impacts are expected to arise as consequence of this restriction.

Analysis of the point 17

Echa claims that "No impacts are expected to arise as consequence of this restriction": **WRONG**

ECHA does not demonstrate anything.

See the analysis by Ph.D. Peter HURLEY (B.Sc(hons), Ph.D, MBA, C.Sci, CChem, FRSC, C.Env, C.WEM, MCIWEM, AFIChemE, Managing Director at Cylenchar Limited), quoted hereafter (*See at Point 11 – Addendum to 5 – 5.1 Sporting steel shot over sporting lead shot – Facilited transport*):

"Steel corrosion in soils releases manganese and nickel as co-pollutants. Manganese is a known lead co-toxicant, and nickel is a known human carcinogen (ref my article and secondary references therein). There are mandatory intervention levels for such pollutants (Ref Directive 2010/75/EU). Accordingly, the assertions of the ECHA report is implausible. There is highly likely to be a pollution risk in relation to shooting steel onto any soil surface and the assertion contained within the report wholly contradicted by the known science and regulations. Moreover, said risks were documented in my paper attached and communicated to the European Shooting association in 2008 and the British association of Shooting and Conservation and UK Defra in 2005. All these submissions are in the public domain. rgo the underlined statement in the ECHA report is further palpable nonsense, and in my opinion tantamount to professional negligence."

18 Page 58 (69 pdf) - 1.5.2. Environmental hazard assessment – 1.5.2.1. Wildlife (birds)

Excerpt:

"Primary and secondary ingestion of lead objects (including fragments/particles derived from objects) will be the principal focus of this assessment. However, other routes of exposure are also possible although they have been studied less intensively (Pain et al., 2014). For example, ingestion via soil, plants or invertebrate prey containing lead derived from lead ammunition is also possible44. This may be especially relevant in shooting ranges (e.g. rifle and pistol ranges) as briefly presented in Section 1.5.4 (case studies). Similarly, consumption of tissues containing lead as a result of the absorption of previously 'shot in' pellets or fragments in wounded (but survived) wildlife is also possible (Pain et al., 2014)."

Analysis of the point 18

See the analysis by Ph.D. Peter HURLEY (B.Sc(hons), Ph.D, MBA, C.Sci, CChem, FRSC, C.Env, C.WEM, MCIWEM, AFIChemE, Managing Director at Cylenchar Limited), quoted hereafter (*See at Point 11 – Addendum to 5 – 5.1 Sporting steel shot over sporting lead shot – Facilited transport*):

"In addition to the above, whilst not an accredited biologist, I am an accomplished scientist and author on scientific and ethical issues. I note within the ECHA report the reference to the wounding toxicity of lead in wildlife, namely:

"Primary and secondary ingestion of lead objects will be the principal focus of this assessment. However, other routes of exposure are also possible although they have been studied less intensively (Pain et al., 2014). For example, ingestion via soil, plants or

invertebrate prey containing lead derived from lead ammunition is also possible32. This may be especially relevant in shooting ranges (e.g. rifle and pistol ranges) as briefly presented in Section 1.5.4 (case studies). Similarly, consumption of tissues containing lead as a result of the absorption of previously 'shot in' pellets or fragments in wounded (but survived) wildlife is also possible (Pain et al., 2014)." Page 54

Within the report there is no balanced reporting of the comparative toxicity of non-lead shot types that are mooted a potential lead shot substitutes in similar sounding scenarios. And the Pain et al., 2014 citation within the ECHA report is not a comparative toxicological study. It is widely known that steel wounded waterfowl are also highly likely to result in fatalities, and tungsten-based alloys have been shown to be carcinogenic. Whilst certain TNI shot products are on the market, I would note that that to my present knowledge wounding toxicity studies on the same have all been short-term

Given the aforesaid, as a scientist, I have concerns over the balance of treatment of lead vs its substitutes by the ECHA Rapporteur, which I would judge by their eristic approach of their arguments in the report, imply preconceived judgement, and betray a less than holistic in approach. Accordingly, any decision of the ECHA and regulators based on this deficient report is very likely to be perceived and politically motivated rather that scientifically based."

19 Pages 101-110 (112-121 pdf) 1.5.3.7. Additional risks related to sports shooting

Excerpt 1:

"Metallic lead is released into the environment at shooting ranges during their service life63. Each pathway is site-specific and may or may not occur at any individual range (US EPA,2005):

- *Lead oxidizes and dissolves when exposed to acidic water or soil.*
- *Lead particles or dissolved lead can be moved by storm water runoff (horizontal migration).*
- *Dissolved lead can migrate through soils to ground water (vertical migration)."*

Analysis of the point 19 excerpt 1:

ECHA claims that "Dissolved lead can migrate through soils to ground water (vertical migration)": **WRONG.**

See the analysis by Ph.D. Jean-Louis SEVEQUE, Hydrogeochemist, Independent environmental expert and Court expert, quoted hereafter (*See Point 6 - Addendum to 3.2 – 3.2.1 Vertical migration of lead in the soil*):

"All known measurements made on lead in soils have shown that migration of lead is about few centimeters and cannot migrate per descensum (means migration will be top to bottom) to underground water. For example, the water at drinking water collection and at the outlet of drinking water treatment plants does not contain lead, because

lead does not migrate toward underground water[1] . It is in contact with the lead pipes of the distribution networks that the water gradually becomes loaded with lead.

Like most chemical elements, the mobility of lead is mainly controlled by its speciation in aqueous phase and by adsorption / desorption and / or dissolution / precipitation processes. The role of certain parameters such as the pH, the redox potential, the mineralogical composition of the sediment and the presence of ligands or colloids in the phase will be decisive (see figure 3 of the FITASC contribution).

Unfortunately, there was a huge problem with lead in France: the Metalleurope site. Regarding all the studies made on this site, it is clearly indicated [2] that lead remains in the surface layers of the soil, between 0 and 40 cm deep, and that moreover, the lead contents in the soils vary according to the use made of these soils. Indeed, it is in agricultural soils that the depth of 40 cm is reached, not in urban soils."

Excerpt 2:

"Although in general risks (and receptors) for shotgun ranges using lead shot and rifle and pistol ranges using lead bullets appear to be similar, specific differences in terms of risk profiles have to be expected for shooting disciplines using lead shot versus shooting disciplines using lead bullets. For example, the migration of lead into surface water is more likely at shotgun ranges than at pistol and rifle ranges because the pollutant load caused by shotgun shooting is wider and the erosion of shot is more rapid than that of bullets because of their smaller size (Kajander and Parri, 2014)64. In addition, in shooting ranges, spent shot and bullets usually fall within an area of deposition which is substantially larger for shot compared to bullets. Figure 1-17 and Figure 1-18 provide examples of possible lead deposition areas in a shotgun and rifle/pistol range, respectively."

Analysis of the point 18 excerpt 2:

ECHA claims that: "For example, the migration of lead into surface water is more likely at shotgun ranges than at pistol and rifle ranges because the pollutant load caused by shotgun shooting is wider and the erosion of shot is more rapid than that of bullets because of their smaller size": **TRUE**.

See *Point 7.5 – Water flow control of the contribution of July 2020*, where FITASC confirmed the necessity for shooting ranges to manage the water flow to prevent or minimize harmful erosion, lead migration outside the boundaries of the shooting range.

[1] Sites potentially polluted by lead: feedback and recommendations, French Directorate General of Health and al., 104 pages, 2015

[2] Lucy SCHAPMAN : Strategies for the rehabilitation of sites polluted by lead: lessons from the METALLEUROPE North site in Noyelles-Godault. National School of Public Health, 54 pages, 2004

20 Pages 103-110 (114-121 pdf) 1.5.3.7. Additional risks related to sports shooting

Excerpt

"Wind can blow dust particles to other areas. There are two kinds of dust which are relevant to shooting ranges, soil dust and lead dust (Australian EPA, 2019). When conditions are suitable, fine particles of contaminated soil may be blown from a shooting range as dust.

There are many conditions[65] which influence the likelihood that dust could become airborne and the distance it could travel, including windy conditions, dry soil conditions, such as during summer and drought, fine soil particles, lack of wind breaks (such as trees, which can reduce windy conditions), lack of ground cover such as grasses and other vegetation.

Small amounts of lead dust can also be released after firing.

Surface and groundwater

Lead exposure in surface (run-off) water of shooting ranges results from corroding lead shot or bullets lying on the surfaces of the range and from lead dust produced during shooting and deposited on the ground. The mobility of lead in surface water depends on the soil conditions and measures applied to limit lead mobility. Even it can be assumed that in many shooting ranges surface water is collected and lead concentrations are measured, only very few data are published. For example, in the surface water of two shooting ranges in Florida, lead concentrations in retention ponds were measured with 289 µg/L and 694 µg/L. In another range, lead concentrations in a retention pond and a lake close to the range were low with 8 µg/L (Ma et al., 2002). According to investigations in Finnish shooting ranges (Kajander and Parri, 2014), lead and the other metals were found to migrate from the shooting range via surface water. Total lead concentration was >50 µg/L for 7/18 samples (39%) and 10-50 µg/L for 4/18 samples (22%). Soluble lead concentration was >50 µg/L for 3/8 samples (38%) and 10-50 µg/L for other 3/8 samples (38%).

Lead from shot, bullet and lead dust from shooting deposited on the ground accumulates in the soil and migrates towards the ground water. The time point when the contamination reaches the ground water depends on the soil conditions and the distance to the ground water. For sites for which a potential risk to ground water has been identified, usually lead concentrations in ground water are monitored to decide on risk reduction measures which is usually remediation. However, published data are scarce.

[65] A combination of these conditions can be a strong indicator that wind could carry dust to a receptor."

21 Page 151 (162 pdf) – 1.6.3 Exposure assessment

Excerpt

"Inhalation exposure can result from lead fumes, aerosols and/or dusts from shooting during sports shooting or hunting, and from melting lead to cast ammunition or fishing sinkers and lures. Oral exposure can result from intake of lead dust (hand-to-mouth) while shooting or handling lead gunshot, bullets or fishing sinkers and lures, when eating, drinking or smoking in an environment containing lead dust, from chewing or swallowing lead fragments. Oral exposure can also occur indirectly via the environment, such as from the consumption of game meat containing fragments of lead gunshot or bullets, or the consumption of milk, meat or drinking water. High lead exposure may also result from swallowed lead particles retained in the appendix or from incorporated lead fragments following a gunshot wound."

22 Page 152 (163 pdf) - 1.6.3.1. Inhalation of lead fumes or dusts from outdoor shooting (uses # 1,2, 3, 4, 5, 6)

Excerpt

"Figure 1-22 shows a schematic outline of an outdoor and an indoor shooting range. In this case, the outdoor shooting range has a "roofed area" covering the shooter. Major differences are the larger dimension of an outdoor range compared to an indoor range and usually natural ventilation in the outdoor range and artificial ventilation in the indoor range."

23 Page 159 (170 pdf) 1.6.3.4. Oral exposure to lead dust (hand-to-mouth) from shooting or handling lead ammunition or fishing tackle (uses 1, 2, 3, 4, 5, 6 and 7)

Analysis of points 20 to 23:

All considerations on the risk of inhalation of lead fumes or dusts from clay target sport shooting (outdoor shooting use #3) are **WRONG**.

1/ We note that the scientific articles, referred to throughout the article 1.6.3.4., do not relate to use #3 (lead gun shot), contrary to the suggestion in the title:

- Gerri M. Mirkin &Erwin Williams (1998): Lead Sampling in a Bullet Recovery Room;

- CDC (1996): the FBI student are practicing bullet firing

- 2017 Llaidlaw et al.: concerns only bullet shooting. See hereafter excerpt of the conclusion: «Shooting lead bullets at firing ranges results in elevated BLLs at concentrations that are associated with a variety of adverse health outcomes and the topic of health risk is an ongoing topic of study […]"

- CSR (2020): lead ingested from reloading activities (home-casting): reloading being forbidden by ISSF and FITASC rules, clay target sport shooting is not concerned by study, and moreover, the Norwegian example only deals with bullets.

- hillman (1967): A rare case of chronic lead poisoning: polyneuropathy traced to lead shot in the appendix;

- Sahmel et al. (2015): only deals with lead fishing weights.

2/ See the 2 reports of report of Dr Vouaux, Specialist in Rheumatology, Graduate in Biology and Sports Medicine, Graduate in Medical Hydrology and Climatology, Graduate in Legal Redress for Physical Injury, National Federal Physician for the French Clay Target Shooting Federation (FFBT), on the insignificant risk of oral exposure to lead at clay target sports shooting:

- *Section 6.5.1 – Lead toxicity and sport shooters' health (Contribution July 2020)*

- *Point 21 - Addendum to 6.5.1. – 6.5.1.1 unsignificant risk of oral exposure to lead at clay target sports shooting*, where he quoted amongst others the example of Danka Bartekova, Slovakian Olympic champion. Below an excerpt of this report:

"To conclude, remaining within the scope of clay target shooting, and to provide quasi-experimental proof of the harmlessness of lead shot ammunition, we must cite the eloquent example of Slovakian champion Danka Bartekova, a professional Olympic skeet shooter with an impressive track record: Twice European Champion, multiple medals earned in World Championships and World Cup finals, bronze medal at the London 2012 Olympic Games, world record holder with a score of 99/100 (set in Cyprus in 2008).

Over a period of 10 years, her training schedule included 200 clay targets a day, 5 days a week, which represents 500,000 cartridges fired (not counting the cartridges fired during competitions).

Although she feels perfectly healthy, she nonetheless wanted to dispel the myth that the lead in the ammunition used for clay target shooting is toxic.

She decided on her own initiative to have a blood sample taken to find out her blood lead concentration: the level found was perfectly normal, negligible and identical to that of a healthy person who had never fired a single cartridge in his/her life.

Several references to this very interesting experiment can be found on different websites."

4/ See *Point 22 - Addendum to 6.5.1. – 6.5.1.2 Tests of hair lead presence carried out on sport shooters*, the hair analysis carried out by the Russian Shooting Federation on three Olympic shooters.

Conclusions:

For lead dust to be released on firing, there must be friction between the lead pellets and the barrel's bore. In modern cartridges that use plastic wads, there is no contact between the barrel's bore and the lead load.

Besides, when a lead pellet hits the ground, it has quite zero speed and zero energy.

The lead pellet, when hardened even with 4 or 5% antimony, remains ductile: it does not split on hitting a target or an obstacle, but it does crash into it.

As a result, there is no possible emission of lead dust in clay target sports shooting using lead shot cartridges.

24 Page 156 (167 pdf) Lead Blood levels (PbB) in shooters – gunshot - Chun et al. (2018)

Excerpt:

"Chun et al. (2018) investigated the exposure to lead and other metals in 9 male and 5 female Korean clay shooting athletes in an outdoor shooting range. Exposure was 292 µg Pb/m3 air measured with personal air samplers and 18.7 µg Pb/m3 with group samplers as reported above. Mean PbB level and standard deviation was 45.2 ± 16.0 µg/L for both sexes combined. The differences in PbB levels were significant between the sexes with 36 ± 7.7 µg/L for females and 51 ± 16.4 µg/L for males. According to the authors, the PbB levels were higher than the upper limit of normal (data not provided). Mean PbB levels in the general population of Korea

(2010 to 2011) were reported with 18.3 ± 7.9 µg/L for females and 22.2 ± 10.4 µg/L for males (Eom et al., 2017). Chun et al. (2018) reported that PbB levels increased with increasing training frequency: 29 µg/L; 4 times/week (n = 1); 36.4±5.5; 5 times/week (n = 7); 58.2±15.5; 6 times/week (n = 6). However, due to the marked sex-related differences in PbB levels, such a separation according to training frequency would have to be performed according to sex. Without such a separation the presented data might be interpreted in a way that females trained less frequently compared to males. The differences in PbB levels between the general population of Korea and the clay shooters were 18 and 29 µg/L for females and males, respectively."

Analysis of point 24:

All considerations on the risk of inhalation of lead fumes or dusts from clay target sport shooting (outdoor shooting use #3) are **WRONG**.

See at *Point 21 - Addendum to 6.5.1. – 6.5.1.1 unsignificant risk of oral exposure to lead at clay target sports shooting*, the report of Dr Vouaux, Specialist in Rheumatology, Graduate in Biology and Sports Medicine and National Federal Physician for the French Clay Target Shooting Federation (FFBT). We quote below his conclusion:

"The very high - and even alarming - values reported by ECHA, and expressed in micrograms per litre, are the following:

- 51 +/- 16.4 µg/L for men
- 36 +/- 7.7 µg/L for women
- 45.2 +/- 16 µg/L on average

Highly surprised by these figures, we reviewed the data of this study in detail in the original text.

We then found that the actual figures in the Chun study are in fact 10 times lower, which gives:

- 5.1 +/- 1.64 µg/dL for men
- 3.6 +/- 0.77 µg/dL for women
- 4.52 +/- 1.6 µg/dL on average

This is because these values are expressed in micrograms per decilitre (µg/dL) which is the reference unit used in the international standard.

Blood lead levels vary from country to country because of the presence of lead in the air and water. Levels are considered normal up to 5 µg/dL, with no real risk, although they may need to be monitored between 5 and 10, and potentially pathological above 10 (*LEAD LEVELS BLOOD, ucsfhealth.org, university of California, San Francisco, 26 April 2019 / LEAD EXPOSURE IN ADULTS, health.ny.gov, publications*).

The sportspeople investigated by CHUN therefore have perfectly normal blood lead values, which is reflected in the study's conclusion: "When asked about their physical condition, the sportspeople in the national shooting team all stated that they were in good health. […]

CONCLUSIONS:

In practicing the various clay target shooting disciplines, even at a very high level, we believe that the use of lead-loaded ammunition does not pose any threat to sportspeople.

There is no serious scientific evidence for banning these munitions on the basis of health criteria, as a review of the literature on the subject has shown.

In the ECHA report, we deplore the fact that the results of the Chun study are transcribed unfaithfully to the text of the publication, and whose figures have been expressed in micrograms per litre and not per decilitre (the international reference unit), which gives values ten times higher and which are likely to impress the readers.

We remain sceptical about the involuntary nature of this unit conversion, which discredits the objectivity of ECHA's argument."

25 Page 285 (296 pdf) - Article 2.6.1.1 – Conclusion on alternatives / Gunshot

Excerpt 1:

"The exact rules149 of the ISSF (rule 9.4.3.1, c) require that pellets must be made of lead,

lead alloy or of any other ISSF approved material. As such, there is no material barrier for competitive shooting using alternative gunshot materials, but an approval of the material by the ISSF is required.

In non-Olympic events, governing rules are set out by the FITASC[150], whom in their rules state that the use of lead is obligatory: chapter 7.8 weapon and ammunition states "the cartridge load must not exceed to 28 grams of lead".

The current situation is that ISSF and FITASC rules encourage the use of lead[151] ammunition at national and local level, even in non-official disciplines/events.

For example, the French association for clay target shooting require the use of lead. In reaction to this, Thomas (2013) argues that steel would be as suitable alternative because:

1. the volume of cartridges fired by competitors,

2. the parity with prices for lead cartridges,

3. the suitability of steel shot to be used in trap and skeet events,

4. and the ease of substitution for lead shot in conventional 12 and 20 gauge shotgun cartridges.

According to (Thomas and Guitart, 2013), Olympic skeet and trap shooting regulations do not stipulate which gauge of shotgun can be used, only the shot load. Consequently, 12-gauge guns dominate the events because of the higher number of shot that can be fired at each target compared to those fired from 20-gauge guns. This facilitates the use of 12-gauge cartridges for Olympic shooting events, Thomas (2013) presents a number of factory loads (See Table 2-28) that are widely available and that could be considered as alternative for lead shot in shooting. Consequently, 12-gauge guns dominate the events because of the higher number of shot that can be fired at each target compared to those fired from 20-gauge guns. This facilitates the use of 12-gauge cartridges for Olympic shooting events, in the same paper, Thomas presents a number of factory loads (See Table 2-28) that are widely available and that could be considered as alternative for lead shot in shooting.

[Table 2-28: Characteristics of steel shot shotgun cartridges for clay target shooting made by major international cartridge companies in 12 and 20 gauge (ga). Velocity of shot is given as feet per second (fps), and meters per second (mps). All cartridges are 70 mm.]

Analysis of the point 25 excerpt 1

"Consequently, 12-gauge guns dominate the events because of the higher number of shot that can be fired at each target compared to those fired from 20-gauge guns.": **WRONG**

In a 24gr load cartridge, there is the same quantity of lead or steel pellets of same diameter, whichever caliber (20 or 12) the cartridge is fired with. One can say so for a 28gr load cartridge.

The shooters have the choice but the very reason why the shooters do prefer caliber 12 to caliber 20 is because the shot pattern is of far higher quality and the balance of the shotgun is better with caliber 12.

Excerpt 2:

According to (Thomas and Guitart, 2013) the loads presented in table closely fit the ISSF requirements:

1. Given the lower density of steel shot versus lead shot, it is necessary to use steel shot of a larger diameter than the lead equivalent, coupled with an increase in shot velocity, to achieve the same ballistic efficiency and effective range. Thus a shot diameter of 2.6 mm might be advisable for Olympic trap shooting, in which targets may be broken at a longer distance than in skeet shooting. The ISSF regulations would, already, allow pellets of this diameter to be used (ISSF 2012).

2. The maximum allowable velocity of steel shot cartridges, as set by the International Proof Commission is 425 m/s (Government of Victoria 2011). A velocity of 390 m/s (for example) would equate with the same velocity of many lead shot cartridges, and still enable steel shot cartridges to perform well at the distances that trap, and skeet targets are usually hit.

It hence appears that the possibilities to substitute lead exist but would require approval of the ISSF and other federation to allow the use of non-lead shot.

The dossier submitter concludes that the use of lead shot in sports shooting is not limited by technical barriers but rather by organisational barriers.

26 Page 322 (332 pdf) – Sports shooting / Availability and suitability of alternatives

Excerpt:

For sport shooting, the dossier concluded differently per type of ammunition:

1. *Gunshot can be used effectively in sports shooting. Alternative shot material has been found to be effective in sports shooting as well, the barriers for further advancing with alternatives that are not technical but are rather imposed by the rules of the ISSF, FITASC and other*

organisations that require lead shot to be used and/or have not approved other shot material.

Analysis of the point 25 excerpt 2 and point 26

ECHA claimed that "*the barriers for further advancing with alternatives that are not technical but are rather imposed by the rules of the ISSF, FITASC and other organisations that require lead shot to be used and/or have not approved other shot material*", which is fully **WRONG**.

ECHA claims that "*According to (Thomas and Guitart, 2013) the loads presented in table closely fit the ISSF requirements:*

1. Given the lower density of steel shot versus lead shot, it is necessary to use steel shot of a larger diameter than the lead equivalent, coupled with an increase in shot velocity, to achieve the same ballistic efficiency and effective range. Thus a shot diameter of 2.6mm might be advisable for Olympic trap shooting, in which targets may be broken at a longer distance than in skeet shooting. The ISSF regulations would, already, allow pellets of this diameter to be used (ISSF 2012).

2. The maximum allowable velocity of steel shot cartridges, as set by the International Proof Commission is 425 m/s (Government of Victoria 2011). A velocity of 390 m/s (for example) would equate with the same velocity of many lead shot cartridges, and still enable steel shot cartridges to perform well at the distances that trap, and skeet targets are usually hit.", which is fully **WRONG**.

At first, a clarification is needed: If the ISSF has defined the maximum of a shot diameter to 2.6mm, advisable for Olympic trap shooting, this only deals with lead shot and according to its ballistics properties. As we will see hereafter, the ballistic properties of the 2.6mm lead shot has nothing to do with the ones of the 2.6mm steel shot. Besides, the average pellet diameter used at ISSF disciplines turns out to be 2.4mm.

Please see:

- *Point 14 - Addendum to 6.1. – 6.1.7. Validation of the calculation model used in all previous studies*;

- *Point 15 - Addendum to 6.1. – 6.1.8. Observations on section E.3.1.2 of the background document to the RAC/SEAC opinion (15th March 2018)*;

- *Point 16 - Addendum to 6.1. – 6.1.9. Overall position regarding ECHA ballistics*.

The physicist Lucien Audibert has carried out the full demonstration that Thomas ballistic assertions are wrong. We quote hereafter L. Audibert' s conclusions:

"*Contrary to what ECHA is asserting, a change in pellets material is not only an organizational or regulatory question. Not only in the one hand replacing lead with steel would not be a perfect fit, but also on the other hand, it would have significant side effects such as the shooters' health and security.*

While ECHA do not give any substantiation to its assertions, we, on our side, used a well-known method of calculation and we validated its implementation in our Python program, as detailed in paragraph 6.1.7.1. Our work is open to comments and can be doubled checked by anyone willing to.

Consequently, we are perfectly confident in affirming that:

As demonstrated in the present document, it is not physically possible to replace lead pellets in shot cartridges with a perfect steel equivalent.

As demonstrated in the present document, the ECHA statements asserting that a 2.6 mm steel pellet shot at a muzzle velocity of 390 m/s would perform as well as a 2.4 mm lead pellet shot with the same velocity in shooting trap and skeet targets are wrong.

As demonstrated in the present document, it is possible to reach a similar particular performance (eg: energy at a specific distance) with steel compared to lead, but at the price of other performance datapoint degradation, some of which being not acceptable."

General conclusions:

The above ballistic study shows that, to have the same energy as a lead pellet to break a target, at 30m distance for example, one has to use a steel pellet:

- either by 2.9 diameter and with a muzzle velocity by 425m/s (high performance steel cartridge with an average pressure by 700b for a 28gr load, usable in a superior-proofed shotgun only);

- or a steel pellet by 3mm diameter and with a muzzle velocity by 390m/s (standard steel pellet with an average pressure by 640b for a 28gr load, usable in a standard-proofed shotgun).

Firstly, in both cases, such large pellet diameters (2.9mm or 3mm) are dangerous as far as ricochet are concerned, and also regarding the shot pattern which differs considerably from a shot pattern of 2.4mm pellets: **FITASC and ISSF would never allow such pellet diameter in their sport rules**.

Secondly, this test shows that using high performance steel pellet with very high pressures are impossible for sport shooters whose health would be endangered by repeated load firing with such average pressure by 700b (*see Dr Vouaux report at section 6.5.2 – Fitasc contribution July 2020*).

Moreover, regarding steel shot cartridges on sale for sport shooting, one can read on their box the average shooting distance until they are efficient (*See Point 16 - Addendum to 6.1. – 6.1.9.5 Two examples of boxes of 28gr steel shot cartridges for sport shooting*): 20-25m for standard steel and 25-30m for high-performance steel, which are both very low compared to standard lead cartridges and to clay target sport shooting requirements.

ECHA has refused to take into account the ballistic study provided in our document last July 2020 (*See the whole section 6.1*), whose scientific process has been widely proven (*see Point 14 - Addendum to 6.1. – 6.1.7*).

If ECHA would keep recommending the substitution of lead by steel, our studies have demonstrated that, for all clay target sport shooting, the target trajectories would have to be adapted to the ballistic performances of steel. As a consequence, the clay target sport shooting disciplines practiced in EEA would have nothing to do any more with the disciplines practiced in the rest of the world.

As shown further in the Analysis of points 34 to 37, that would cause an unfair competition between shooters in EEA countries and shooters in third countries, be in Europe or elsewhere, and would undermine equality of sport practicing between them and fully disturb the meaning of European & World titles at clay target shooting disciplines.

27 Page 247 (264 pdf) Annex of the annex – C.1.1.1.2 Non-lead alternatives

Excerpt

Steel (soft iron)

Steel was one of the first widely used lead alternatives that the ammunition industry turned to. But steel is one hundred times harder than lead, with only two-thirds its density, resulting rather different ballistic properties when compared to lead.

Therefore, rather than steel, "soft iron" is used for shots, which is manufactured by annealing iron containing approximately 1 % or less carbon (Thomas, 2019).

Steel shot does have the potential to cause some choke expansion ("bulging") particularly with heavy loads in older, traditional lightweight guns. Care is also needed when shooting steel shot as it can ricochet more than lead. However, an unsafe shot with steel would also be an unsafe shot with lead. As a result of its hardness, steel shot has traditionally been contained in robust plastic wads (BASC) 81

Steel shot may be coated with a thin layer of copper or zinc to inhibit rusting which is permitted under US regulations (US FWS, 1997).

28 Page 248 (265 pdf) Annex of the annex – C.1.1.2. Sports shooting

The evidence provided in the call for evidence concerning the use of alternative shot in clay target shooting is less clear than for hunting.

ISSF and FITASC rules requires the use of lead shot with a gauge not greater than 12 mm (usually 12 mm is used). Shotguns must be smooth bored. They are invariably 12-gauge, single-triggered and over-under type — one barrel is placed above the other. They fire cartridges loaded with lead pellets: the weight of the pellet load must not exceed 24.5 grams per cartridge; the diameter of each pellet must not exceed 2.6 millimetres. Guns and cartridges are subject to official checks during the shooting programme.

Based on the demand from hunters and sports shooters, soft iron shots have also been developed for competition purposes (Figure C.1-1).

Analysis of the points 27 and 28

The non-lead alternative recommended by ECHA at clay target sport shooting is soft iron shot. ECHA also writes that "Steel shot may be coated with a thin layer of copper or zinc to inhibit rusting which is permitted under US regulations (US FWS, 1997)."

Again, ECHA is not clear regarding the non-lead alternative recommended:

- soft iron must mean low carbon steel or mild steel (or even "black steel" because of its appearance);

- Will ECHA recommend copper-plated or zinc-plated steel shot? If so, we dare wonder why, knowing that zinc are dangerous metals for fauna and even flora, as demonstrated by FITASC at *section 4.1 – Fitasc contribution July 2020*.

The steel shot from sports cartridges with low carbon steel, as analysed by FITASC (*See section 4.1 – Fitasc contribution July 2020*), is not protected against corrosion. It contains no zinc and less than 0.1% chromium.

We want to address another huge problem with steel in the cartridge that has not been mentioned elsewhere and which may cause big troubles for sport shooting: the sport shooting cartridges not being neither waterproof nor airtight, the storage of ammunition with steel shot under humid atmospheric conditions can and will cause these steel pellets to coalesce in the cartridge, creating thus a big bullet type.

We refer to *Point 9 - Addendum to 4.1. – 4.1.1 Corrosion of the steel pellets in the cartridge*, where Dr Jean-Louis Sévêque, Hydrogeochemist, Independent environmental expert and Court Expert, explains the phenomenon of "Coalescence" which will cause the steel pellets to corrode and aggregate together is quoted hereafter:

"*Coalescence is a phenomenon whereby two identical but dispersed substances tend to come together. The main phenomenon that comes into play is that the material optimizes its surface under the action of surface tension, so as to achieve a minimum of energy. Coalescence usually occurs in fluids but can also unite solid particles as coalescence of steel shot under atmospheric conditions. It is found in several process. One is described below.*

Steel pellets cartridges must be stored in dry and temperate places, otherwise the pellets may corrode and aggregate together (see pictures below) to change the ammunition into a large bullet type, therefore with a much greater range and a very important ricochet risk. The black steel used for sport shooting cartridges is a steel which corrodes (ref. point 4.1 of Fitasc contribution to ECHA). It does not contain zinc and less than 0.1% chromium (steel with low sensitivity to corrosion contains more than 10% chromium)."

Analysis of the ballistic consequences of agglomerate formation due to the oxidation of steel pellets in sport shooting cartridges:

We refer to *Point 17 - Addendum to 6.1. – 6.1.10. Analysis of the ballistic consequences of agglomerate formation due to the oxidation of steel pellets in sport shooting cartridges*, to the

complementary study aiming at analyzing the ballistic consequences of agglomerate formation due to the oxidation of steel pellets in sport shooting cartridges.

The conclusion of the study is that the use of steel pellets cartridges imposes additional constraints in terms of storage to avoid the phenomenon of corrosion of the pellets. In the event of improper storage, the steel pellets may aggregate and form one or more projectiles of larger dimensions than expected.

The maximum risk happens when the entire charge aggregates into a single projectile. The above study has shown that such a projectile not only has a longer reach than unaggregated pellets, but also much higher velocities and energies.

The velocity and energy of these projectiles being very high, there is a significant risk of ricochet and accident associated with sport shooting based on steel pellets cartridges, and at uncontrollable distances.

29 Page 302 (313 pdf) – Table 2-36: Scenarios and range types used for impact assessment

Excerpt:

Although the European sports shooting confederation reports wooden structures to prevent ricochets, which have been installed in the Netherlands (personal communication), the German shooting range guidelines (German Bundesministerium der Justiz, 2012) prescribes only the use of safety glasses when using alternative gunshot at shooting ranges. Based on this, the Dossier Submitter concludes that the use of alternative shot does not require additional RMMs compared to the use of lead shot. From an internet search it was learned that the prices of such glasses vary between €5 - 50 depending on brand, make, etc. The Dossier Submitter assumes a price between €5 - 50 per shooter.

30 Page 336-338 (353-355 pdf) annex of the annex – D.1.2.1.5 Ricochet

Excerpt 1:

All types of shot can ricochet (i.e. deflect) from a hard surface such as water, rocks, or the surface of tree trunks if they hit the surface at an acute angle. Shot made from soft lead, tungsten and bismuth-tin may flatten and even break up on direct contact with rocks. However, steel shot will bounce off hard surfaces, and is not so prone to deformation or fracture, but whether this difference is sufficient to increase the likelihood of injury is not supported by the available evidence.

Excerpt 2:

Steel shot has become the only realistic alternative and was from the beginning foreseen to generate an increased risk of accidents caused by shot ricocheting from clay pigeons' installations, ground (running target), etc. However, after 20 years and millions of rounds later there has been no detectable change in accidents caused by ricocheting shot[125]. So, this initial concern proved groundless. Shooters are recommended to wear safety glasses (in some

disciplines this is mandatory). This precaution is mainly introduced to prevent eye injuries from clay pigeon splinters, but will in addition protect against shot – either direct or ricocheting shot. This applies equally to steel and lead shot.

Based on research and experiences there is no indication that a change from lead shot for hunting to other types including steel shot would cause any increased danger due to ricocheting shot.

31 Page 427 (444 pdf) – Annex of the annex D.2.2.2.1. Ricochet in sports shooting range

Excerpt:

The issue of ricochet and increase risk thereof when using steel shot has been widely discussed. Many of the commenters highlighted the risk of increased ricochet at shooting ranges due to the use of steel shot.

The Dutch shooting federation[157] highlighted that in the use of steel shot at shooting ranges they had no encountered any accidents related to ricochet of steel shot since the introduction of the general ban on the use of lead at shooting garages; objects on which steel shot could ricochet had been covered with wood.

Analysis of the points 29 to 31:

ECHA claims that "*Based on research and experiences there is no indication that a change from lead shot for hunting to other types including steel shot would cause any increased danger due to ricocheting shot*": **WRONG**

ECHA has quoted twice the Dutch shooting federation confirming that objects on which steel shot could ricochet had been covered with wood.

Please see *Point 18 - Addendum to 6.2 – 6.2.1*, the analysis of the ricochet of the lead carried out by the Russian Shooting Union Executive Committee at the Fox Lodge complex in March 2021, using laminated plywood of 18mm and 12mm thickness.

We quote hereafter their conclusions:

"*Conclusion:*

1/ Quantity of the ricochet of steel pellets is 2-3 times higher than of lead at the same weight of the charge 24 gram (slides 4, 6 7, 9-10, 12-13);

2/ At the distance till 4 meters from the reflected surface ricochet of both steel and lead pellets is nearly equivalent;

3/ At the distance of 5 meters and more, the ricochet of steel cartridges is 2-5 times higher than ricochet of lead cartridges (slides 5, 8, 11)."

32 Page 325-326 (342-343 of pdf) of Annex of the annex – Sports shooting – Availability and suitability of alternatives

Excerpt:

In addition, wear of gun is also caused by the physical impact released by the recoil from heavy loads, which may cause stress to the gun lock and stock Recoil is a function of, powder type, load weight and velocity and, in principle, independent of shot material.

However, as non-lead shot is normally accelerated to a higher velocity there is a general tendency that alternative gunshot may cause a more pronounced recoil, though lighter loads and improved powder composition can compensate for this. Danish gunsmiths have experienced that guns more regularly need maintenance and lock repair when firing large numbers of rounds of high velocity (>420 m/s) cartridges with steel shot. This applies only to standard guns that are not constructed to deal with heavy recoil[110], but would equally apply to heavy load lead shot cartridges.

Analysis of the point 32:

ECHA claimed that "Recoil is […] in principle, independent of shot material": **WRONG**

Please see the study carried out by the physicist Lucien Audibert in April 2021, at *Point 23 - Addendum to 6.5 - 6.5.3 - Impact in terms of recoil when shooting steel-pellet cartridges instead of lead-pellet cartridges with sports arms*, whose conclusions are quoted hereafter:

"*As demonstrated above, the recoil the shooter encounters is significantly higher with the use of a steel-pellet cartridge, compared to the use of a lead-pellet cartridge.*

This difference is about 18% in terms of energy, and 16% in terms of average forces / pressure. For a sport shooter shooting several thousands of cartridges per year, such increases could have major consequences in terms of health."

We also quote again the conclusions of Dr. Vouaux (*See section 6.5.2 – Fitasc contribution July 2020*) quoted hereafter:

"*Clay target shooting requires the use of a large number of cartridges, fired at sustained rates, especially for competitive shooters.*

Recoil is the most significant physical constraint, and remains a major concern in sports trauma.

Every effort must be made to reduce and limit this inconvenience.

Enforcing the use of steel pellet cartridges through regulations leading to an increase in recoil (and noise), would therefore be contrary to the imperatives of health prevention and protection of sports people."

UNDER WAY: we will provide soon a comparative study between lead and steel shot regarding the shotgun vibrations.

33 Page 428 (445 pdf) Annex of the annex - D.2.2.2.2. Noise

Excerpt 1:

In response to follow up questions, the FITASC submitted an extensive study on the possibilities to substitute lead with steel in sports shooting. This submission contained a comparative study in the levels of noise generated by both lead and steel and argued that using steel shot would require guns to generate higher pressure which would be associated with higher noise levels. These levels would be of such a degree they are no longer compliant with regulatory limits (the study quotes the French regulatory framework for noise).

Analysis of the point 33 excerpt 1:

ECHA claims that: "*This submission contained a comparative study in the levels of noise generated by both lead and steel and argued that using steel shot would require guns to generate higher pressure which would be associated with higher noise levels*": **WRONG.**

The comparative lead / steel acoustic impact study featuring in the FITASC contribution of July 2020 was carried out with comparable cartridges references, thus between lead shot and standard steel shot (same muzzle velocity around 400m/s): the same standard-proofed shotgun was used for all acoustic tests.

The study showed that even with a standard steel cartridge, the increase in pressure and in noise level is high compared to a lead shot cartridge.

See point II here of *Point 19 - Addendum to 6.4.3 – Precisions on Comparative lead / steel acoustic impact study in 6.4.1 to 6.4.2*, with precision of the acoustics expert Yves COUASNET, a Judicial Expert to the Paris Court of Appeal, the Administrative Courts of Paris and Versailles, and accredited by the Supreme Court, in a note dated 24 February 2021:

"There is clearly a misunderstanding of our previous analysis on the differences in noise emission by projectiles, because the comparative noise tests on projectiles made of lead shot or steel shot, were carried out using the same weapon, the latter also being designed to support steel shot cartridges, the same cartridge load (28 g), the same methodology and the same sample size of 10 shots."

In the case of a comparison between a lead shot (muzzle velocity 400m/s and 580b pressure) with a high-performance steel cartridge (muzzle velocity 425m/s and 690b pressure – *See section 6.1.9.5. Two examples of boxes of 28gr steel shot cartridges for sport shooting*), one would have to use a superior-proofed shotgun for both samples. And due to the very high difference shown in pressure (+100b for the high-performance steel shot), a high increase in noise level is expected.

Excerpt 2:

In a number of EU countries, clay shooting ranges are subject to an authorization procedure prior to their installation, during which the potential for noise and soil and pollution are investigated.

The essence of these regulation when it comes to noise is to limit the level of noise to avoid neighbourhood disturbances.

In their submission, FITASC argues that the use of steel shot would lead to more noise, this is based on a acoustics study that using steel sheet is associated with an increase of 11.5 % in pressure generated in the same gun, shooting similar loads. This increased pressure would is caused by the higher powder charge used for steel projectiles and cause an increase in noise during the detonation phase.

Such an increase in pressure would at 100 m distance cause an increase in noise of around + 6 to +9 db using steel. Measurements were performed using the NF s 31-160(20129)158 and NF EN ISO 17201-1159(December 2018) standards.

Taking into account the comparative noise levels measure at the same point of 83 db and (lead) and 92 db (steel) an increase of 6 db gives an increase in sound pressure of pf (0.796-0.282) 180 % and would constitute a breach of peace.

The submission does not argues to what extend this breach of peace is achieved by all shooting ranges and its representativeness is therefore not known.

The Finnish Bat on management of shooting ranges says on noise that the possibilities for noise prevention at a shooting range depend on what the starting situation is like. If one starts implementing noise control measures from a situation where the shooting range does not have firing enclosures, noise berms or any other structures intended for noise abatement, one can achieve clear noise abatement results with enclosures and berms to the sides and the rear, for instance, from 5 to as much as 15 dB. However, if the starting situation is that the range already has relatively good enclosures, side berms and possibly other noise control measures implemented as well, it may be difficult to achieve an additional noise abatement of just 5 dB at the site

And highlight that noise management is first and foremost a matter of location, it recommends using noise zones to avoid noise disturbance. The BAT states that, according to estimates, 285,000 people live (in Finland) the noise areas of public highways, and 500,000...600,000 in the noise areas of city streets. In total, around 1 000 000 people are estimated to be exposed to noise exceeding the guideline values (Saarinen A 2013). The number of people exposed to shooting range noise is less than 1 % of this.

The dossier submitter recognises that noise may be an issue but also highlights that without contextual information (population living around shooting ranges) this point is difficult to assess further.

Analysis of the point 33 excerpt 2:

ECHA claims that: "*The submission does not argue to what extend this breach of peace is achieved by all shooting ranges and its representativeness is therefore not known" and that "The dossier submitter recognizes that noise may be an issue but also highlights that without contextual information (population living around shooting ranges) this point is difficult to assess further*".

If it is difficult to assess breach of peace due to noise without contextual information, it is however easy to expect that countries with a high population density[1], a high number of shooting ranges (*see point 2.3 Fitasc contribution July 2020*) and a high volume of clay target sold annually (*see point 4 - Addendum to 2 – 2.5 - European market of clay targets*), such as France, Italy, Germany, would be heavily impacted by noise breach of peace following a lead ban or restriction.

The example raised by ECHA from the Finnish BAT concerns a country (Finland) where the population density is one of the lowest in Europe and in the world and (16 h/km^2) and which is a small clay target market. For comparison, the population density is 105 h/km^2 in France, 207 h/km^2 in Italy and 225 h/km^2 in Germany.

See below our conclusions from *point 20 - Addendum to 6.4 – 6.4.6 Information on population density in Europe*:

The noise level and the frequency of firing constitute the main threats to the sustainability of sports shooting facilities.

These sport facilities must be located in areas with very low population density and be away from any home, over a radius of up to two kilometers, given the prevailing winds carrying sound waves.

This type of terrain is relatively easy to find in countries with low population density, as is not the case in high density countries (see table 15).

Each country has its own legislation on noise pollution and the maximum noise level acceptable to the neighborhood. The vast majority of sports facilities comply with their national legislation, although many are now very close to the maximum allowable limit.

Steel pellet sport cartridges require greater pressure so that their speed partly compensates for their poor ballistic qualities: they are therefore the cause of a greater sound emergence than lead pellet sport cartridges. Thus, the use of steel pellet sport cartridges would cause the limits authorized for the neighborhood to be exceeded.

Countries with a low population density are often, in fact, countries with few sports shooters. Conversely, the most important countries for sport shooting are countries with a high population density. Consequently, any increase in sound emissions by sports facilities, in particular due to the use of steel pellet cartridges, represents an immediate risk of relationship difficulties with their neighborhood and a very serious risk of closure by court or administrative decisions.

This question must imperatively be taken into account by ECHA and the European Commission.

34 Page 6 (17 pdf) – Executive summary

Excerpt:

"The four main justifications for an EU-wide restriction measure are:

1. To ensure a harmonised high level of protection of the environment and human health to address the risks identified.

2. To address the lack of EU wide commitment to fulfil the EU Birds Directive, and the AEWA and CMS Raptors MOU6 agreements towards the protection of birds and their habitats.

3. To ensure the free movement of goods within the Union.

4. To ensure a level playing field for all engaged in sports shooting within the EU."

35 Page 302 (314 pdf) – A: Shooting areas or ranges where steel shot is used

Baseline

A few Member States have implemented legislation that restricts the use of lead at shooting ranges. In Sweden, Norway and Denmark the use of lead shot in shooting ranges is banned in the entire territory (with some derogations in place; see below); in the Netherlands the use of lead shot is banned for clay pigeon shooting. In Belgium, in the Flemish region, there is a regional ban for the entire territory.

Analysis of the points 34 and 35

ECHA presents its restriction proposal as being a warranty "To ensure a level playing field for all engaged in sports shooting within the EU": **WRONG**

By following ECHA's recommendation to either forbidding or restricting lead use to a category of high-level Olympic shooters at clay target shooting sport, the European Commission would not keep fulfilling its mission given by the Lisbon Treaty to protect the sport and the sportsmen:

Such a ban or restriction would cause an unfair competition between shooters in EEA countries and shooters in third countries, be in Europe or elsewhere. That would undermine equality of sport practicing between them and fully disturb the meaning of European & World titles at clay target shooting disciplines.

We hereby reaffirm that, to ensure a level playing field for all engaged in sports shooting not only in Europe but also in the whole world, ECHA must allow lead use for the clay target sport shooting in EEA countries, with the correlated implementation of a European Lead Management Charter for Sport Shooting Ranges such as presented by FITASC (*See Chapter 9 of the Fitasc contribution in July 2020*).

The European sport titles do concern not only the EEA countries, but also all the 21 European countries outside EEA: Albania, Andorra, Armenia, Azerbaijan, Belarus, Bosnia-Herzegovina, Faroe Islands, Georgia, United Kingdom, Israel, Kosovo, Monaco,

Montenegro, Republic of Moldova, Russian federation, San Marino, Serbia, Switzerland, Former Yugoslav Republic of Macedonia, Turkey, Ukraine.

Presently in Europe, only Belgium, Denmark, Norway, Netherlands and Sweden are already under lead ban (with a few derogations for some). These 5 countries represent each very few clay target sport shooters and are very small markets for clay targets: the 5 countries annually cumulate 53 million clay targets out of 455 million (incl. 150 million for UK), thus 11% of the EEA+UK market (*see point 4 - Addendum to 2 – 2.5 - European market of clay targets*).

In comparison, 2 countries, France and Italy, both represent annually 130 million clay targets, thus 28% of EEA+UK market.

If, after the Brexit, UK (representing annually 150 million clay targets) falls out of the scope of the EC lead restriction in EEA, UK still belongs to the European continent and counts for European sport events, like Russia and 19 other countries listed above.

Clearly, such a restriction on lead would undermine equality in sport shooting practice in Europe:

- not only inside the European continent where the European titles would lose their fundamental purpose;

- but also in the whole world where the EEA shooters could not compete any more at equality World titles with shooters out of the EEA.

36 Page 7 (18 pdf) Executive Summary

The derogation for continued use of lead gunshot for sports shooting (identified as 'OPTIONAL CONDITIONAL DEROGATION' in Table 2 below) is presented as an option in case policy makers would not wish to impose a ban on lead gunshot for sports shooting (either on the placing on the market or on the use). The intention of this option is to retain a degree of control (and harmonisation) over the conditions of continued use. The derogation outlined as 'OPTIONAL CONDITIONAL DEROGATION' would set a minimum standard of RMMs at sites using lead gunshot and would introduce obligations for Member States to properly identify and license only those athletes that have a legitimate need to use lead gunshot (for example to train for or participate in international competitions). In addition, this derogation would be accompanied by a labelling requirement for the supplier and a reporting requirement for the Member States which would grant such a derogation. This will allow the Commission to monitor the continued use of lead gunshot in different EU Member States and facilitate the enforcement of the derogation.

It is important to note that the restriction including the optional conditional derogation for gunshot is not as effective in controlling the identified risks as a ban on use (identified as 'PREFERRED OPTION' in the summary table below), but may be considered more proportionate by decision makers, should the rules of these competitions continue to require the use of lead gunshot.

37 Page 430-431 (447-448 pdf) Annex of the annex - D.2.3 Restriction scenarios & proposed action

ANNEX to the ANNEX XV RESTRICTION REPORT – Lead in outdoor shooting and fishing

D.2.3. Restriction scenarios & proposed action

Table D.2-3 Restriction options for sports shooting with lead gunshot

	Scenario	Comment
RO1	Ban on the **placing on the market** and **use** of **lead shot** for sports shooting	Effective, monitorable but Olympic and ISSF rules currently require the use of lead shot for skeet and trap disciplines
RO2	Ban on the **placing on the market** and **use** of **lead shot** for sports shooting with a derogation for **permitted retailers** to sell and **permitted individuals** to use (Olympic/ISSF elite level only; training and events) with permitting done by MS with annual reporting[160] to COM.	Effective (reduction of release ca. 50 %), practicable, monitorable
RO3	Ban on the **placing on the market** and **use** of **lead shot** for sports shooting with a derogation conditional that the use takes place at permitted sites/facilities with permitting done by MS with annual reporting[161] to COM where *[the risks to the environment (including wildlife and livestock) and humans (via the environment) are minimised and]* the following OCs and RMMs are implemented: • Regular [at least once a year] lead shot recovery with [>90 %] effectiveness (calculated based on mass balance of lead used vs lead recovered) to be achieved by appropriate means (such as walls and/or nets[162], and/or surface coverage); AND • Monitoring and treatment of surface (run-off) water to ensure compliance with the Environmental Quality Standards of the Water Framework Directive; AND • [Ban of any agricultural use within site boundary]	Effective (reduction of release less than 90 %), practicable, monitorable
RO4	RO2 and RO3	Effective (reduction of release higher than 90 %), practicable, monitorable

[160] Reporting should cover the number of retailers permitted to sell lead ammunition as well as the number of permitted individuals

[161] Reporting should cover the number of sites and volume of lead ammunition used at each site

[162] in some sources referred to as 'shot curtains'

ANNEX to the ANNEX XV RESTRICTION REPORT – Lead in outdoor shooting and fishing

	Scenario	Comment
RO5	Compulsory information on the hazard/risk of lead, transition periods and availability of alternatives at point of sale and on product packaging. Individual cartridges should be indelibly labelled (contains lead (Pb) shot, for sports shooting only [at permitted sites]).	Awareness raising could be achieved by information on the package of lead containing shot.

In case of no regulatory action, business as usual would continue and 33 425 tpa of lead would be released to the environment.

In the absence of data on how much lead shot is already recovered, it is assumed that the annual amount of lead recovered (regularly collected from surfaces without direct soil contact) to be 5 %, and 31 754 tpa of lead would be released to the environment (e.g., soil) without regular recovery or with long intervals between recovery of lead from soil by soil removal.

D.2.3.1. RO1: Ban on the use of lead gunshot for sports shooting

Effectiveness

This risk option would be effective because it would result in a 100 % reduction of lead release for sports shooting with shot, it reduces the risks from lead for humans and the environment with risks from alternative(s) being much lower, it introduce the least compliance burden (i.e. no specific environmental risk management measures required), and has the highest cost benefit (steel shot is almost the same price as lead shot).

Practicality

Suitable alternatives are available. However, Olympic and ISSF rules currently require the use of lead shot for skeet and trap disciplines. Assuming that there will be no rule changes in the short term that would allow the use of alternative shot materials, and acknowledging the importance of participation in international sports shooting competitions to society, a complete ban on placing on the market and use of lead shot, including all sports shooting, may be considered to have an unacceptable socioeconomic impact for athletes and interested public following such sports events.

Monitorability

The risk option is implementable, easy to enforce and monitorable. In addition, it is consistent with the preferred restriction option for lead gunshot used for hunting, resulting in a blanket ban on the use of lead gunshot throughout the EU, irrespective of purpose. Such an approach would simplify implementation and enforcement of the overall restriction in terms of lead gunshot (as well as the existing restriction on the use of lead gunshot in wetlands) as it would not be possible to legally purchase lead gunshot for one purpose and use it for a restricted purpose.

D.2.3.2. RO2 Ban of lead shot with derogation for permitted athletes

This risk option is a ban on the placing on the market and use of lead shot for sports shooting but with a derogation for permitted retailers (to sell) and permitted individuals (to use). Member States would be responsible for granting permissions to permitted retailers and permitted athletes (such as with IOC status) and would report annually to

Analysis of the points 36 and 37:

At first, here again let us remind you that FITASC and ISSF have made proposals, scientifically proven (See all points above), to control possible lead pollution in the soils of sports facilities. The methods we propose are a solution for a lead responsible management, and our federal organizations as well as the managers of sports facilities have offered to organize its application through a European Charter for the lead management on the shooting grounds.

However, the solutions we propose are simply dismissed, under the pretext, among other things, of a residual risk for birds. Yet it will seem obvious to all nature lovers that no bird ventures onto a sport facility where thousands of shots are fired each day.

The derogation RO2 proposed by ECHA states that some shooters ("*Olympic/ISSF elite level only / training and events*") will be allowed to shoot lead;

The derogation RO3 proposed by ECHA states that the lead use will be allowed at some shooting ranges.

Besides, the restriction options proposed by ECHA raise objections on different levels, considering:

1/ Lead shot recovery: arbitrary rate by 90% and annually frequency;

2/ the practicability on sport shooting installations;

3/ the equality of practicing of the clay target sport shooting in EEA;

4/ Pyramidal organization of the clay target sport shooting.

1. Lead shot recovery: arbitrary rate by 90% and annually frequency

See *point 29 - Addendum to 8 – 8.1 Scientific Conclusion*, the analysis by Ph.D. Jean-Louis SEVEQUE, Hydrogeochemist, Independent environmental expert and Court expert:

"*ECHA requires/ annual lead recovery of at least 90%. From where this number 90% comes from? What is the scientific basis? It has been shown above that if lead could be toxic for human being, the most important parameter is the biodisponibility, and mainly the gastric bioaccessibility, for lead. And what is the form of ingested lead? A bullet? Certainly not on a clay target shooting range. Gas? lead is not volatile. Dust due to the friction of lead on a pebble in the ground because of the wind? Yes, probably the only transfer way. The question is: what is the relationship between the amount of lead in the soil and the lead dust produced? What is the bioavailability of lead dust? And so far, why 90%? In the meantime, ECHA said annual lead recovery. Once again, from where this number 1 year comes from? What is the scientific basis?*

2. Practicability on sport shooting installations: Impossible implementation on one clay target sports shooting facility which usually is multidisciplinary.

2.1: The clay target sport shooting facilities are used for different disciplines, Olympic (ISSF) and non-Olympic (FITASC):

- an Olympic trench installation is also commonly used for Universal Trench, Compak Sporting, Sporting or Helice;

- an Olympic Skeet is also commonly used for Universal Skeet, Compak Sporting and Sporting;

There are two reasons for this: 1/ optimizing their use and 2/ concentrating the leadshot falls on a small area whenever possible, to make their recovery easy.

Only few sport shooting installations in Europe are devoted either to sole Olympic disciplines or to sole non-Olympic ones. It is impossible, unless for rare exceptions, to isolate shooters who would use lead shot cartridges from those who would use steel shot cartridges (See *point 2 - Addendum to 2.3 – 2.3.1. Multidisciplinarity of the sport shooting installation*).

2.2 Ballistic considerations also make this cohabitation impossible. The use of steel shot for Olympic and non-Olympic shooting activities would require a complete redesign of trajectories and a complete reorganization of shooting ranges. This would represent an unbearable cost for many shooting ranges.

For one given discipline, it is impossible that some shooters shoot lead while some others shoot steel because the official target trajectories of the discipline would have to be adapted to steel shot ballistic performance.

2.3 We also demonstrated, with supporting evidence, that the mixing of steel pellets with lead ones on a shooting range significantly aggravates lead oxidation. Moreover, if lead pellets retain an economic value after recovery, because they are recyclable, when these pellets are mixed with steel ones they lose all value. Having two types of ammunition coexisting will deprive shooting ranges of the financial means necessary for lead management of the responsibility from which you do not relieve them.

The prospect that some shooters could shoot with lead while others would necessarily shoot steel on adjacent facilities seems both unrealistic from a sporting point of view and environmentally inconsiderate.

2.4 Regarding some disciplines, the ricocheting risk could be high, amplified by the soil composition (rock, stone, …), endangering shooters, referees and spectators.

The ballistic performance discrepancies between lead and steel, widely demonstrated through our various studies, lead to the conclusion that steel is fully incompatible with the clay target sport shooting. Why does ECHA refuse to take this evidence into account?

3/ Equality of practicing of the clay target sport shooting in EEA: The proposed restrictions would create a discrimination of non-Olympic sport shooting

ECHA mentions the Olympic rules as a basis for a possible exemption, since they stipulate the use of lead shot.

You forget that the same rules apply to all Olympic and non-Olympic disciplines.

It is therefore necessary to remind you here of the importance of the non-Olympic activities managed by FITASC:

- these activities are official sporting activities, recognized as such by their Ministry of Sports and by the National Olympic Committees,

- they represent the majority of sport shooting in the 70 most economically developed countries,".

- competition in these activities is also organized in a pyramidal structure, from amateur (or recreational) shooting to high-level shooting, with regional, national, continental and world competitions. At the top of this pyramid are to be found about 50 international competitions taking place all around the world (Grand Prix, continental and world championships) in which more than 13,000 sport shooters take part.

Stipulating an exemption for Olympic shooting activities only, would be a clear discrimination of non-Olympic sport shooting.

4/ Pyramidal organization of the clay target sport shooting

4.1 The concept that only top shooters should be allowed to shoot with lead, while others should shoot with steel, is simply a destruction of our sport in the medium term.

The organization of clay target sport shooting is similar to that of all sports, and can be represented by a pyramid structure. The base of the pyramid is made up of beginners, junior or adult shooters. The higher you climb the pyramid, the more your competitive qualities are recognized by your sports results. At the top are international shooters or members of national teams who represent their country. This is true for both Olympic and non-Olympic disciplines.

To rise or remain at the top of the pyramid, each year the shooters are compulsorily confronted in club, regional and national competitions with all of all the shooters constituting the pyramid.

Consequently, all the shooters in the pyramid must be able to train and compete with the same sporting regulations, using cartridges with comparable ballistic performance.

How can we imagine that shooters from Olympic or non-Olympic disciplines, from EEA countries, compete with shooters from other continents, when they would be forced to train with ammunition that does not have the same ballistic characteristics!

We have seen that shooters whose governments have banned the use of cartridges loaded with lead no longer appear in international rankings and that their national market is extremely small (see sales statistics for clay trays) compared to other European markets. The markets of these northern European countries represent only a few hundred shooters and this has nothing to compare with France, Italy, Spain, Portugal, the countries of central Europe and even less than the UK.

ECHA says that in countries where steel pellet shooting is compulsory, shooters are happy with it. We have strong reservations about this statement. Many shooters from these countries regularly ask FITASC to intervene with their government to change the law and be able to shoot with lead.

We have a perfect example with the Belgian shooters. The Belgian federation FBCT has around 3,500 licensed shooters for the clay target shooting disciplines. Sports facilities in northern France receive many of these shooters who, rather than shooting steel in Belgium, come to shoot with lead in France, sometimes traveling several hundred kilometers. Around 470 Belgian shooters are licensed to the French Federation FFBT to be able to train and participate in club and regional competitions. Great care must be taken not to confuse the opinions of activists with the real people involved, the sports shooters.

Failure to acknowledge this will be showing complete bad faith and may appear to be a purely dogmatic decision. Prohibiting lead yes that will be understandable if there were no other solutions, but we are proposing a scientifically supported solution for sport shooting in a responsible manner.

4.2 As shown in our answers to ECHA's questions (email dated December 22nd, 2020), the pyramidal base of clay target sport shooting is mainly composed of shooters practicing non-Olympic activities.

Shooters who compete in ISSF Olympic activities have most often started in non-Olympic FITASC activities. For example, Olympic Trap shooters mostly come from high-level competition in Universal Trench (non-Olympic).

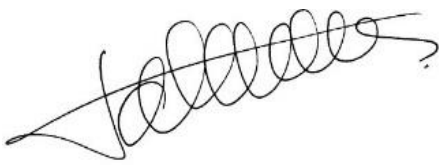
2 reasons for this:

- first, non-Olympic activities are easier to access. Their sport facilities are more numerous, better distributed and, consequently, closer to the shooters' place of residence;

- second, the international championships of FITASC activities are "open", without limitation of national origin, to all shooters who are members of a federation affiliated to FITASC: there the members of the National teams are selected and entered by the national federations.

Restricting the use of lead shot to high-level sport shooting and/or Olympic activities will deprive both of them of new athletes. It is a slow but irreversible destruction.

Finally, as stated in the Analysis of the points 34 and 35, by either forbidding or restricting lead use to a category of high-level Olympic shooters at clay target shooting sport, the European Commission would not keep fulfilling its mission given by the Lisbon Treaty to protect the sport and the sportsmen.



Jean-François PALINKAS

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