**Green Warriors: The Toxic Legacy of Warfare**

**52’ Script**

Key

**Commentary**

To be subtitled

English dialogue

Captions/graphics

 Martin [01:00:07]

Go, go.

Martin [01:00:13]

**When we started to investigate arms pollution, we never thought we'd be diving into a lake in the Vosges at night.**

Diver Manon [01:00:22]

It's a kind of burgundy warhead, rusty, completely rusty.

Martin [01:00:24]

Ok!

Martin [01:00:31]

**We didn't expect to find tons of munition, especially grenades, underwater discarded by the French army.**

00 49

**Up until the 2000s, France sank, buried and destroyed thousands of tonnes of munitions, leaving behind traces of invisible pollution.**

Major Laurence [01:01:00]

You know, a lot of things in the army are confidential.

Martin [01:01:06]

**Long forgotten, these dump sites are now releasing pollutants that are toxic, carcinogenic and can cause genetic malformations.**

Aaron Beck [01:01:16]:

TNT and RDX are used abundantly in modern…Both of those are toxic to varying degrees.

Martin [01:01:25]

**We're going to conduct an unprecedented year and a half long investigation with the help of German and French scientists.**

**To measure contamination, we'll search for the remains of military weapons all over the country, even in the depths of lakes and seas.**

Diver01:45:20

Shells!

Martin:

Shells!

Mathilde [01:01:48]

**These residues of explosives could have contaminated the environment and drinking water.**

**We'll present our results to the people living near contaminated areas.**

Gerard Lorfeuvre [01:02:01]

There comes a time when we have to say stop and find lasting solutions.

Presenter France 5 Lorraine [01:02:07]

An investigation carried out by our colleagues from Green Warriors for France 5 reveals a great amount of toxic substances in the waters of the Pearl of the Vosges.

Mathilde [01:02:15]

**Our findings will be reported by the media and relayed by elected representatives in the regions, the Senate and the European Parliament.**

Damien Carême [01:02:24]

Yes, it's going to be expensive, but if we do nothing, how much will it cost us?

Mathilde [01:02:28]

**This weapon-related pollution has already claimed victims in Europe. In Sardinia, the clandestine activities at NATO's largest military test site have transformed the landscape and may have contaminated thousands of residents.**

Marie-Claude Mellis [01:02:48]

They all died of the same thing. Leukaemia and lymphoma. All of them.

Opening credits

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A FILM BY MATHILDE CUSIN, MANON DE COUET AND MARTIN BOUDOT

GREEN WARRIORS: THE TOXIC LEGACY OF WARFARE

03 25 Caption

Kiel

Germany

Mathilde [01:03:29]

**It all began in the Baltic Sea, off the coast of Germany, on board the Alkor... a scientific exploration ship.**

03 41

**Aaron Beck, a marine biology researcher working for Kiel’s centre for ocean research, is in charge of operations this morning.**

Aaron Beck [01:03:49]

Lab to deck: We continue at 2 metres, then at 2 metres 40.

Mathilde [01:03:55]

**This American scientist is working with his team on an unsuspected pollution threatening the icy waters of the Baltic.**

**It can be found in the surrounding seabed, in craters like this one... There is lots of ammunition of all kinds there.**

Aaron Beck [01:04:11]

All of these little points are various munitions. Torpedo heads, ground mines. Each one of these things, like mines, are two metres long. They have quite large features. All of these munitions at this site are from world war II. We’ll collect samples all along those points.

Martin [01:04:31]

**With this sampling device, the researcher wants to collect water near these munitions to find out if they release toxic substances.**

**The device is equipped with underwater cameras that give researchers a live view of the areas to be sampled.**

Aaron Beck [01:04:49]

That’s one of these ground mines, it’s probably two metres long. What’s more, there’s explosives. And we're sitting in just fifteen metres of water depth. So you’re talking about 10, 12 metres below the hull of the ship and then there’s a ground mine which is essentially made to destroy a ship that goes over the top of it.

At this site, so in this whole dumping ground, there’s supposed something like 20 000 tonnes.

Mathilde [01:05:12]

**20,000 tonnes of munitions were deliberately discarded here…This rare post-war footage proves that.**

Aaron Beck [01:05:22]

So this is en masse dumping of munitions, you see. So basically the idea, simply to get rid of the stuff. To dump it overboard as quickly as possible. So these are actually exactly the kind of cases that we find not too far from here. And you can see the beaches from here. I think this is one of the most shocking thing.

Aaron Beck [01:05:46]:

Ok, you can secure it on the bridge.

Mathilde [01:05:51]

**The ship is equipped with a laboratory where Aaron Beck can immediately analyse the underwater samples. The scientist is looking for molecules derived from explosives.**

Aaron Beck [01:06:05]

This peak of TNT is very clear. Any time you find TNT it’s very clear that the munition’s leaking. And if you find ADNT it means that TNT had been leaking out.

Aaron Beck: [02:16:44]

They are just as dangerous as they were on the day they were dumped. They’re also essentially large pieces of toxic chemicals so they’re constantly releasing toxic chemicals in the environment.

Mathilde [01:06:30]

**To document his research, Aaron Beck has already collected several thousand samples from almost 300 sites across the Baltic Sea.**

06 41

**He has projected this data on a map accessible to the general public. It is a ground-breaking project, because until now, pollution of the seabed by the military has never been studied.**

Aaron Beck [01:06:58]

So all of these red dots are samples we collected from bottom water. The size of the dots and the darkness of the colour indicate the TNT concentration. So the bigger the dots and the darker they are the higher concentration. The yellow areas are areas that are known to be contaminated or suspected to be contaminated with munitions.

Mathilde [01:07:17]:

How do you explain that there’s no data on the European coasts?

Aaron Beck [01:07:21]

So far, we haven't done any work there. And I don’t think that even previously there was any work done along there. This is a complete blackbox.

Mathilde [01:07:28]

**Have munitions been discarded along the French coast?**

Martin [01:07:38]

**The Army has never published a precise list of sites.**

**In Paris, we went through press cuttings dating from the end of the First World War to the present day looking for clues.**

**A shell in a fisherman's net. Children injured by an explosion on the beach. A young camper killed.**

08 02

**Hundreds of munitions found all along the French coast.**

**A certain file draws our attention...**

**The wreck of a destroyer that allegedly sank off the coast of Ouistreham. It was submerged with a ton of explosives on board. HMS Lawford.**

08 28 Caption

Ouistreham

Calvados

Martin [01:08:30]

**This is where we start our investigation into this maritime military pollution in France.**

Martin [01:08:37]

The GPS coordinates are North 49°25757 West 23807.

-That's it.

Good.

Martin [01:08:47]

**To document the environmental impact of these munitions sites, we're going to join forces with a team of professional divers.**

Martin [01:08:57]

Arriving in four minutes.

Diver:

Ok.

Martin [01:09:03]

**Lionel Rard is in charge. This biologist runs Odysseus, an association that protects the seabed.**

**All are experienced divers, used to working at great depths.**

Lionel Rard [01:09:18]

As soon as we reach the bottom, we do a check and head toward 310.

Diver:

310.

Martin [01:09:31]

It's right here, guys, it's 25 metres deep.

Martin [01:09:34]

**Before going underwater. We called the German scientist, Aaron Beck. He advises us on how to proceed.**

Aaron Beck [01:09:43]

Hello Martin. Can you hear me okay?

Martin [01:09:45]

Yes, I can hear you, Professor Beck. So what should we do? What's the method you think?

Aaron Beck [01:09:50]

The best that we’ve seen is to actually go down with divers and collect water directly next to the munitions. You can do that with a pump.

Martin :

Ok go !

Martin [01:10:12]

**Twenty-five metres below, sunk during the Allied landings in 1944 with its cargo of munitions, is the wreck of HMS Lawford...**

10 27

**It is still there. At the bow of the ship. 21 combat missiles abandoned 80 years ago.**

Aaron Beck [01:10:41]

The closer you’re able to sample, the better. The more samples you can take spatially around the site, the better. Water is the easiest thing to measure. But sediments can be interesting, because some of these degradation products of TNT actually tend to stick to sediments. The most important thing is not to touch any munitions. Clearly all munitions are dangerous because they are still just as explosive as they were originally.

Martin [01:11:17]

**After 30 minutes of diving, we must quickly process the samples to preserve them as best as possible.**

Martin [01:11:25]

Thank you. I'll filter it and put it in the tanks straight away.

Martin [01:11:26]

Once we have the samples, how do we filter them?

Aaron Beck [01:11:37]

So we fill the water sample into the infusion bag and then you attach to that a small plastic syringe barrel that has a special resin that the explosives stick to. And so you filter the water sample through that column and then that column should have any explosives that were in the water.

Martin [01:11:58]

**How many sites like this exist off the French coast? There are sites on nautical charts that caught our attention. So-called “Munition dumps”. One of them is located in the Atlantic ocean of Fouras, near Fort Boyard, less than two kilometres from the coast.**

12 26 Caption

Fouras

Charente-Maritime

Martin [01:12:30]

What's the average depth according to your information?

Lionel Rard [01:12:37]

We're one metre at low tide and six metres at high tide.

Martin [01:12:42]

**The explosives dump is below this buoy, this shell-looking buoy.**

**Beneath the surface are tons of munitions from the First World War that were submerged by the French army in the 1920s. They are said to still lie on the seabed. Diving is prohibited in the area.**

Lionel Rard [01:13:07]

The metal detector can go down to 60 metres. When I bring it closer…

I'll have to scan the area carefully.

Martin [01:13:17]

**There's nil visibility. The divers descend without seeing anything.**

13 28

**Using metal detectors, they find shells buried in the sand.**

Female diver [01:13:37]

They've found something.

Male diver:

Shells!

Martin [01:13:41]

What have you found?

Male diver [01:13:45]

It's cylindrical, it's long, and it looks like a shell. It's not small.

Martin [01:13:49]

Have you managed to take samples?

Diver [01:13:51]

We took a core sample. It’s attached to the water sample.

Martin [01:13:56]

**Once these collected samples are filtered we'll send them to Aaron Beck's laboratory for analysis.**

14 1

**These sea dumps don't just date back to the two world wars.**

**The French Army is said to have deliberately used the country's coastline as an explosives dump until the 2000s.**

**One man was involved in these operations. Major Marcel Lawrence.**

14 30

**He served 36 years in the French Navy. At the end of his career, he was captain of the Fidèle, a boat in the French fleet. One of his missions was to discard obsolete weapons and munitions overboard.**

14 45

**…Then a dramatic accident happened.**

Major Lawrence [01:14:52]

There were 26 of us. Sixteen crew members plus six explosives technicians.

Martin [01:15:01]

**On 30 April 1997, Major Laurence and his crew were given the task of disposing of obsolete munitions. In total, they had to dispose of 1,400 grenades in a pit off Cherbourg, eleven kilometres off the coast.**

Major Lawrence [01:15:21]

At around 10:25, I heard an abrupt explosion. It was a bit different from underwater explosions. This immediately made me think that a grenade must have exploded on the ship. I didn't have time to think for long because the boat sank in…I’m not entirely sure but in about three minutes it was gone. I can still see the bow sinking into the sea, a bit like in the movies. As the water broke, I said to myself, 'We're not going to make it this time, we're not going to make it.'"

Martin [01:16:05]

**Of the 22 crew members, five died, including three who disappeared at sea.**

Major Lawrence [01:16:11]

I’ve had nightmares for a long time.

Martin [01:16:19]

Was discarding ammunition, shells, and grenades into water quite common or was it very rare?

Major Lawrence [01:16:27]

Oh no, it was a common thing. I've seen ammunition submerged almost every year. They played with fire and then with explosives.

Martin [01:16:42]

What do you make of it?

Major Lawrence [01:16:44]

The sea is a sort of maritime rubbish dump. It's a sea dump. Avoiding discarding at sea like that can prevent accidents later on…and the pollution.

Martin [01:16:58]

**According to our information, the French Navy has never published any studies on the environmental impact of these explosives dumps.**

**Six months later, the results of our samples are finally in.**

**In Europe, there are no standards to regulate explosives residues.**

**We had to compare our data with the values observed by Aaron Beck's team.**

17 24

**At Fouras, the water’s level of DANT, a molecule derived from the decomposition of TNT, reached 2,401 ng/L.**

**This is the highest level the German researchers team has ever seen.**

**DANT is potentially carcinogenic, suspected of impairing fertility and causing genetic malformations.**

**There was 2355 ng/kg of crude TNT in the sand.**

**We also found significant levels of cobalt, nickel, arsenic and lead, which exceed environmental risk thresholds.**

**The water and sand samples collected off Ouistreham, close to the missiles, also showed contamination.**

**We found residues of TNT and its derivatives in the sand. 242 ng/kg.**

18 27

**The water had high levels of heavy metals, 3100 nanograms per litre of lead. This is twice the environmental safety standards.**

18 30 Graphics

Lead

18 40

**In France, there is no official data on the precise number of munitions submerged.**

**After a year's investigation, we have identified at least 103 areas along the entire coastline, from the North Sea to the Mediterranean.**

18 48 Graphics

103 munition dumps

18 59

**Our discovery has reached the Senate. Centrist Senator Annick Billon wanted to see what we had found. She then questioned Patrice Vergriete, the Minister for Ecological Transition.**

President [01:19:13]

Our colleague Annick Billon now has the floor.

Annick Billon [01:19:16]

Dear Minister, according to an independent study carried out in conjunction with an ocean research laboratory, it has now been proven that these submerged munitions represent a real ecological threat, with consequences to people, environment, economy, and health. What action are you going to take to get rid of the seabed of these environmental time bombs? Thank you very much.

Chairman [01:19:40]

Thank you, Minister.

Patrice Vergriete:

Senator Billon, the State is perfectly aware of the issue of dumped munitions. Consequently, the State is interested in any study aimed at improving knowledge of the behaviour of submerged munitions over time in order to support interministerial work and ultimately be able to adapt existing civil and environmental protection systems.

Martin [01:20:03]

**Since then, neither the Ministry of Ecology nor the Ministry of the Armed Forces have been interested in knowing more about the studies we carried out.**

**Despite our numerous requests, the French Navy refused all our interview requests.**

20 21 Mathilde

**In Nantes, the most senior official in the French fleet came to attend the Assises des économies de la mer, the annual Maritime Economy Conference.**

**Here he is on stage: Admiral Nicolas Vaujour, the Navy's Chief of Staff.**

Nicolas Vaujour [01:20:40]

We're the world's second-largest maritime power, which is great and extraordinary. For me, it means a lot of responsibility and many duties. All the climate issues necessarily concern us.

Mathilde [01:20:55]

**We tried to interview him.**

Manon: 01:20:59:00

Hello Mr. Vaujour, excuse me.

Manon :

I'm a journalist for the programme Green Warriors for France 5.

We sent you an interview request by email but it was refused.

Councillor :01:21:07

-What's it about?

Manon:

About pollution near marine waste dumps.

Manon:

I'd like to insist…Can we at least give you the results of our study and I'll be happy to talk to you about it.

21 18

We have the results of a study…

Nicolas Vaujour :

No, thank you.

Manon:

...which shows contamination. Why don't you just look at them?

Councillor: 01:21:22

Do not insist madam.

Mathilde [01:21:25]

**The Army didn't want to give us any more details about the number of maritime dumps known to date.**

**It simply says that it carries out clean-up missions: operations that involve destroying munitions found in the water.**

21 45

**For 25 years one organisation in France has been sounding the alarm about the pollution caused by explosive dumps at sea. It's called Les Robins des Bois, Robin Hoods, and their director who leads their investigations is Charlotte Nithart.**

Charlotte Nithart [01:21:59]

There's an amendment that's been incorporated into the Archive Act that de facto makes all information that could lead to the location of munitions a secret indefinitely. This effectively closes the door on military archives. We were impatient to see what was there. It goes against the grain of transparency, the public's right to information, and a good policy for protecting the marine environment and protecting people.

Mathilde [01:22:38]

**In the course of her investigation, Charlotte Nithart discovered that there are munitions not only along the French coast, but all over the country. For example at the bottom of Lake Gérardmer, in the Vosges mountains.**

Charlotte Nithart [01:22:52]

Phosphorus on the lake. Fumes containing phosphorus have appeared on the surface of Lake Gérardmer in recent days. The lake still contained phosphorus munitions from the First World War.

23 02

We wrote to the Vosges Prefect in 2001. In fact, no munitions are visible up to 30 metres from the shore and to a depth of eight metres. If there are any left, they are hidden in the thick layer of mud.

23 16 Caption

Gerardmer

Vosges

23 16

Contrary to what your letter suggests, I can assure you that Lac de Gérardmer is not a place where pollution is rampant.

Mathilde [01:23:26]

**Is Gérardmer lake really safe from contamination by explosive residues?**

Martin [01:23:33 ]

**To find out, we have to dive in.**

**We meet up with Lionel Rard, the marine biologist and his team of professional divers.**

Martin [01:23:48]

Do you have everything you need for the sediment? Is the camera working?

Perfect. Be careful!

Martin [01:24:07]

**Just six metres from the shore, the divers find the first trench bombs: hand grenades from the First World War.**

24 19

**Some intact…others completely ripped open, revealing the contents of the explosives.**

24 31

**Dozens of individual pieces of munition scattered around…until we came across a pile.**

**We took water from the lake, which, in times of summer drought, is used to supplement the town's drinking water supply.**

**We also collected samples of sediment and aquatic grasses near the munitions and on the edge of the lake.**

Martin [01:25:01]

What kind of ammunition is it?

Male diver:

It’s ammunition number one. A trench bomb.

Martin:

Trench bomb, ammunition one. And how many metres below were you?

Male diver :

What?

Martin :

How many metres down do you think were?

Male diver :

4.6

25 14

It was a piece of shell that's completely oxidised. It’s over there at a depth of two metres.

Martin:

So we've got shells and grenades. All of it in a lake where people fish and walk around.

25 30

Hello!

Martin [01:25:40]

**Until nightfall, we carried out more dives to recover as many samples as possible.**

**All the samples were filtered and sent to Aaron Beck’s scientists.**

26 04

**Five months later, they sent us their results.**

**They were clear: the lake was heavily contaminated by munitions.**

**Levels of TNT in the water reached 327 ng/L, which is among the highest levels ever measured by the German researchers team.**

**The water sample also contained levels of iron, lead and titanium that exceeded environmental safety standards. The underwater flora sample taken near the shore contained 2589 nanograms of TNT.**

**With this discovery, Lionel Rard wanted to get things moving.**

**He had an appointment with the Mayor of Gérardmer, Stessy Speissmann Mozas, and his deputy in charge of security.**

27 00

**The biologist presented them with the findings of our investigation.**

Lionel Rard [01:27:05]

In certain flora samples that we took, we found that certain values were high. This means that there is indeed pollution entering the biodiversity. So my question is, what do we do about it?

Stessy Speissmann Mozas:

Well, the first thing is that I'm going to contact the authorities like ARS to find out what's going on, and then to try and change the current legislation on water potability so that these tests are included. In other words, we don't currently have quantified data such as the ones you've provided. So some of this data is bound to be interesting.

Martin [01:27:40]

**The local media picked up on our results and came to interview the mayor.**

Stessy Speissmann Mozas [01:27:45]

We didn't necessarily perceive this idea of quantity and we were also unable to qualify the type of pollution.

Presenter France 3 Lorraine [01:27:58]

Good evening everyone. Tonight's top story is Lake Gérardmer, heavily polluted by munitions from the First World War. Heavy metals, TNT, an investigation carried out by our colleagues from Green Warriors for France 5 reveals the enormous presence of toxic substances in the waters of the Pearl of the Vosges.

Journalist France Bleu Lorraine [01:28:14]

This pollution is potentially dangerous. It's a real time bomb piled up at the bottom of the lake.

Martin [01:28:21]

**Since then, the town council has referred the matter to the prefecture and the Regional Health Agency. New samples will be taken from the lake and the drinking water treatment plants.**

28 35

**How far does this toxic legacy of warfare reach?**

28 41

**In north-eastern France, entire territories have been contaminated by explosive residues left over from the First World War.**

**The most contaminated conflict zones were used as sites for storing and destroying munitions or as military camps.**

**Some of these sites are still in use today.**

29 07 Caption

Butte de Vauquois

Meuse

29 11

**For the past fourteen years, one scientist has been warning of the health repercussions of military pollution in these areas.**

**Daniel Hubé is a geologist at BRGM, the French National Geological Research Bureau.**

Daniel Hubé [01:29:25]

For the moment, there is no compulsory research on explosive residues in France.

Mathilde [01:29:31]

**His conclusions are clear: explosive residues have contaminated the environment.**

**Today, he continues to document this military pollution with new samples.**

**Like here on the Vauquois hill, at the former front line of the Great East region.**

Daniel Hubé [01:29:50]

Right now, I'm filtering the water to 45 micrometres to remove all the fine particles.

29 57

I've sounded the alarm, which means that I've identified a typical risk situation. The groundwater is very clearly contaminated by compounds from the war. These are known to be persistent pollutants. So once it's in the ground, it's there for centuries, it won't move again.

Mathilde [01:30:17]

**Beyond taking samples from the natural environment. The researcher would like to study contamination in drinking water taken directly from household taps.**

Daniel [01:30:27]

Sampling tap water is extremely interesting when you take a risk-based approach. We need to assess whether people are exposed or not.

Mathilde [01:30:39]

**We're going to try to help the scientist…we're going to take tap water samples from people living along the former war front.**

Mathilde [01:30:48]

Hello! I've come for your drinking water.

30 55

Sample number one.

Danielle Hautecoeur :

I remember when I was younger seeing massive piles of wood a little further on. I don't know how long they were, but there were shells arranged like this.

Mathilde:

Are you interested in knowing what's in the drinking water?

Pascale Lorfeuvre :

Oh yes. Already on top of that, when they do their exercises at the military camp the houses shake.

31 15

Hélène Giraudot:

I almost don't want to know.

Mathilde [01:31:17]

**We took around twenty samples and sent them to the German scientist Aaron Beck.**

**Four months after the samples were taken, we invited the residents and mayors of the towns concerned to share with them the results of our investigation.**

31 35

**The meeting took place in Suippes, a town next to a firing training camp where shells from the First World War were believed to have been stored.**

31 44

**The participants of our study attended the meeting.**

**Daniel Hubé, a specialist in military pollution, came to comment on our results.**

**The regional councillor for the Great East region, Christophe Dumont, was also present.**

Mathilde [01:32:01]

Thank you all for coming this morning to hear the results of our investigation. Out of twenty samples, 17 contained explosive residues. Some at trace levels, but some at significant levels. Two were found at Mourmelon le Grand and Asfeld, exceeding the recommendations of the US Health Agency.

Daniel Hubé [01:32:22]

There are indeed some points that are extremely important. What we can say is that these traces, first of all, are compounds which do not occur naturally. This is an area that is still in its infancy. So the health authorities are wondering how to interpret these values.

Danielle Hautecoeur [01:32:37]

I'm very surprised by all these results because personally, I always drink tap water. But what you're saying isn't reassuring.

Christophe Dumont [01:32:46]

Christophe Dumont, Regional Councillor, the Great East region. It really raises important public health issues.

Mathilde [01:32:54]

**The councillor wanted to address other regional councillors.**

Franck Leroy [01:33:00]

The next question is from Christophe Dumont and concerns water pollution by explosive residues.

Christophe Dumont:

Thank you Mr. Chairman. A team of journalists has been working for over a year on the toxic legacy of the two world wars and weapons-related pollution. I would like to ask you, Mr. Chairman, what is the region currently doing to deal with the problem and what does it intend to do now that new data is available?

Franck Leroy:

Thank you. Now over to Véronique Guillotin.

Véronique Guillotin [01:33:26]

Thank you, Mr. Chairman. To date, European and national regulations on explosives residues do not specify a regulatory value. It's now up to the scientific community to come up with objectives and for the government to set clear thresholds. In any case, this subject is now on our radar.

Martin: [01:33:46]

**Until the French authorities define regulatory standards for explosive residues in drinking water, the Great East region cannot do much.**

**The number of sampling campaigns across the region is increasing. However, no regulatory thresholds for danger are currently being studied.**

**All over France, both on land and at sea, weapons-related pollution has left its mark on the environment.**

34 14

**Elsewhere in Europe, this contamination has already claimed many victims.**

34 26 Caption

Quirra

Sardinia

Mathilde: [01:34:30 ]

**600 kilometres from the French coast is Sardinia and its idyllic beaches.**

**At first glance, you might think that its coastline is home to a seaside resort,**

**but in reality it's home to NATO's largest military testing centre.**

34 47

**To understand its immensity... we need to climb to a higher point.**

**Massimo Corrado, a Sardinian physicist and activist, is joining us this evening.**

**For several years he has been studying these sites and their impact on the region.**

Massimo Corradu [01:35:08]

They're doing missile tests in this area. They fire missiles and try to hit targets that are launched from there. There are also workshops and a munitions factory. That's only part of the base that's located here, by the sea. In the mountains there, there's a whole area that's even bigger. It's a really huge area.

Mathilde [01:35:31]

This whole area is off limits to the public? Is it a military base?

Massimo [01:35:34]

Absolutely. You can't enter this area. It's controlled. It's forbidden all year round, except in the summer when people are allowed on the beach.

Mathilde [01:35:46]

**Founded in 1956, the ‘Salto di Quirra Experimental and Training Area’ is NATO's largest military testing zone in Europe.**

36 08 Map

Cagliari

Perdasdefogu

Muravera

Teulada

36 03

**This zone, which is off-limits to civilians, covers 12,000 hectares in the mountainous region between the towns of Perdasdefogu and Muravera. Missile tests are carried out from the coast toward a vast area of sea that is off-limits to fishermen and ships for much of the year.**

36 23

**A third firing and bombing range is located to the south of the island, in the Teulada region. Every year, armies from all over Europe come here to practise and test weapons of all kinds.**

36 42

**In the south of the island, as in Cagliari, the regional capital, locals have learnt to live with this permanent military presence...**

**Every month, warships dock in the town's harbour while the soldiers head inland to train out of sight.**

37 04

**Within the Sardinian city, some people do not take kindly to this presence.**

**Massimo Corradu has been investigating the environmental consequences of these classified activities for several years. This physicist was even recruited as an expert for several judicial investigations into the Salto di Quirra testing facility. As a result, he was able to access numerous confidential documents, including these video archives filmed by the military.**

Massimo Corradu [01:37:36]

These experiments were carried out in the mountainous part of the range.

Massimo Corradu [01:37:45]

Obsolete munitions were destroyed.

Because the Italian army had a huge number of weapons to destroy this site was used for decades right up until the 2010s. Some weapons even dated back to the Second World War.

 Massimo Corradu [01:38:19]

We can see that the explosions produce columns of smoke a hundred metres high, full of chemicals that the wind then disperses over several kilometres. They can have very serious health consequences.

Mathilde [01:38:31]

**These mountains aren't the only ones affected. On the beaches of Quirra, the armies are testing missiles that are just as polluting.**

Massimo Corradu [01:38:41]

When missile propellants are tested, their thrust creates enormous heat. This combustion produces a large quantity of fine particles. These tests are still current. For example, they recently carried out tests on the TEL missile system, developed by the French and Italian armies and sent to Ukraine.

Mathilde [01:39:09]

**Have these intensive activities contaminated the Sardinian environment?**

**To this day, it's hard to tell…**

Mathilde [01:39:13]

Would you be interested in taking samples over there to see if these areas are polluted?

Massimo Corradu [01:39:19]

Yes, I'm very interested. It's important to have an independent analysis because most of the analyses so far have been carried out by the military themselves and I doubt the results very much.

Massimo Corradu [01:39:37]

The first problem is that the area is very vast and so we can't go and take samples everywhere. We have to choose.

In Perdasdefogu there's a road that leads directly to this area, but it's a military road so we can't use it.

To get there, the only option is to walk.

Mathilde [01:40:00]

**To take samples in the areas indicated by Massimo Corradu, we first have to go around the firing range. It's impossible to miss, as the constant movement of tanks has scarred the landscape.**

Mathilde [01:40:16]

Listen, you can hear shooting. Look, they're over there. It echoes throughout the valley.

Mathilde [01:40:24]

**The authorities in charge of the military base have never replied to our numerous requests...**

**…So we decided to walk across the mountains.**

Mathilde [01:40:50]

Are you ready to do a bit of climbing?

Mathilde [01:40:53]

**We have to climb for several hours before reaching one of the bombing zones.**

Mathilde [01:41:00]

We're about to enter a military zone.

Mathilde [01:41:05]

**On this mountainous plateau, military activity has also changed the landscape. It left these craters around which nothing seems to grow.**

**Now that there's no surveillance, we're trying to take samples as close as possible to these areas.**

Mathilde [01:41:26]

We're going to take a quick sample and leave quickly ok?

Mathilde [01:41:33]

There are cartridges everywhere, look.

Mathilde [01:41:40]

**To find out if the explosions have polluted the soil, we need to sample the stagnant water in these craters.**

**We are wearing surgical gloves not to compromise the samples, but also to protect ourselves from possible contamination by dangerous metals.**

**We’re also taking soil and sediment samples.**

42 01

**Around the area, we passed numerous agricultural fields and herds of cattle... Strangely enough, the army has given special permission to farmers to use thousands of hectares of land around the test sites.**

**On the coast, the missile launch pads are located in a much more accessible area.**

42 22

**On the bottom left is a missile launcher…and on the right, Quirra beach.**

Mathilde [01:42:29]

There are about a hundred metres separating the site from the beach with tourists.

Mathilde [01:42:36]

**We're going to take sand samples to find out if the beach-goers are exposed to heavy metals or explosives.**

Mathilde [01:42:43]

Hello.

Mathilde [01:42:47]

**These samples will be sent to Aaron Beck, the researcher at the German university who specialises in military pollution.**

43 00

**In the neighbouring villages, the impact of these activities has become a taboo over the years.**

**For months, we tried to get locals to speak up…but in these streets silence reigns...often for fear of threatening the economic activity.**

43 19

**In the suburbs of Cagliari, one woman nevertheless agreed to talk to us and break the silence.**

**Marie-Claude Mélis had to come to terms with the loss of her son in 2004. His name was Valéry.**

Mathilde [01:43:33] :

How old was your son?

Marie-Claude Mellis [01:43:35]

When he died? He was 26. He was about 1 metre 84. He weighed maybe 80 kilos. But when he died, he weighed 48 kilos.

Mathilde [01:43:49]

**Marie-Claude Mélisse, from France, still wears her son's military medal around her neck.**

**Valéry Mellis was a soldier.**

**He served at the Quirra range until the day he was diagnosed with serious cancer.**

Marie-Claude Mellis [01:44:08]

He felt like he had a sore throat. His throat was very inflamed. So he went to the infirmary at the barracks. They told him it was a sore throat, so they gave him some medicine for it. But it didn't go away and he had a bit of a fever too. He was hospitalised. That's when they discovered that he had lymphoma. He died on 4 February 2004.

Mathilde [01:44:42]

**After his death, Valéry Mellis parents asked the military authorities to investigate the cause of his death….To no avail.**

**The Italian Army always denied any responsibility. The family managed to have biological samples taken from the young man's body analysed by an independent researcher. They found metallic nanoparticles.**

Marie-Claude Mellis [01:45:07]

Molecules that are not biodegradable. Also a strange compound about two microns in spherical shape that comes from a very high-temperature explosion.

Mathilde:

All this was found in your son's body?

Marie-Claude Mellis:

Yes. She found the same thing in all the soldiers who had died.

Mathilde:

Are there many families like yours?

Marie-Claude Mellis:

Well, we know a few in Cagliari and the surrounding area. They all died of the same thing, leukaemia or lymphoma.

Mathilde:

All of them?

Marie-Claude Mellis:

All of them.

Mathilde [01:45:57]

**How many families like the Mellis' have been destroyed?**

**One man is trying to get to the bottom of it and get justice.**

**For several months, lawyer Gianfranco Solai has been gathering testimonies from potential victims of this military pollution.**

Gianfranco Solai [01:46:21]

Do you remember if your parents or grandparents had thyroid problems?

Woman 2 [01:46:28]

My mother died at 42, she had liver cancer. My father died when he was 35, he had a tumour in his throat. They all died of cancer. Except for my sister, she had her thyroid removed.

Mathilde [01:46:44]

**This morning is Gianfranco Solai's first meeting with these six women.**

**All are from the same village, all mourning the loss of loved ones.**

46 54

**Like Eliza Zedda, wife of Giovanni Zeda, who died of lymphoma two years ago.**

Eliza Zedda [01:47:00]

My husband, the love of my life. When we fell in love I was 18 and he was 24. In the end, we spent 58 years together, engaged and married. I miss my love so much.

Eliza Zedda [01:47:25]

In the early 2000s, a lot of people contracted diseases that we'd never seen before and died from them. So by asking questions here and there, we realised that these illnesses were probably caused by uranium and thorium present in the weapons of war that they had first tested here.

Mathilde [01:47:52]

**The women in the room all share stories like hers.**

47 57

**Valentina Sardu saw her mother die just a few weeks ago.**

Valentina Sardu [01:48:03]

She had to undergo a lot of tests until it was discovered that she had widespread cancer. It was everywhere. All her organs were affected. There was nothing they could do. She went through months of hell. All that pain was hell.

Gianfranco Solai [01:48:26]:

Do you know if there are other people in the region who are currently suffering from cancer?

Eliza Zedda [01:48:36]:

Yes, there are people dying every day, even young people.

Woman 2 [01:48:41]:

Yes, I know some, but we can't do anything for them, they're very sick.

Mathilde [01:48:47]

**Like these women, many people in Sardinia are mourning their loved ones who left too soon.**

**They are looking for answers.**

**Were local residents and soldiers exposed to toxic substances used during war exercises?**

**A few months after our investigation in Sardinia, we received the results of our samples.**

49 12

**They were all contaminated by explosives and heavy metals.**

**Our samples taken in the vicinity of the military firing range showed the presence of RDX, an explosive classified as potentially carcinogenic. There were also levels of titanium in the soil six times higher than those recommended by the European Union.**

49 23 Graphics

RDX

Titanium

49 31

**The analyses from the bombing site in the mountains revealed the presence of numerous explosives, including TNT, as well as barium at levels twice the environmental risk thresholds.**

49 38 Graphics
Barium

TNT

49 43

**Exposure to barium can cause heart and muscle problems.**

**On Quirra beach where tourists swim, within the missile launch zone, we once again found RDX in the sand**

**We also found TNT and lead in the areas where dairy cows graze.**

49 56 Graphics

RDX

TNT
Lead

**Our discoveries could stir things up all the way to the European Parliament.**

**Sardinian physicist Massimo Corradu and Lionel Rard, the biologist with whom we conducted the investigation in France, want to join forces.**

**They had a meeting with Damien Carême, an ecologist MEP.**

Lionel Rard [01:50:27]

We really hope that by knocking on the door of the European Parliament, we can find a way to alert politicians and bring about concrete decisions that can result from our actions.

Massimo Corradu [01:50:42]

People who live very close to polluted areas have a much worse health situation than their fellow citizens. It's not just happening in Sardinia, it's happening everywhere these weapons are used. The work we have done together is very important and I hope it will have an impact.

Mathilde [01:51:05]

**Damien Carême wants to use our results to launch a Europe-wide debate.**

Damien Carême [01:51:10]

It's an extremely worrying subject. The first thing is to get transparency on all this data. I think we need a European programme. In any case, something really needs to be done because it's a matter of concern and a matter of public health and environmental quality. Of course it's going to be expensive. But we do nothing, how much will it cost us?

Martin [01:51:38]

**The race against time is on:**

**With the help of other MEPs, the Green MEP wants to call on the Presidency of the Council of the European Union to set up a working group before the next elections.**

**In Sardinia, lawyer Gianfranco Solail has filed a complaint against those responsible for the military testing grounds.**

**All across Europe, the battle against the toxic legacy of warfare is only just beginning.**