

Incident Assessment

Incident ID	CIVo497
Location	Alpaca land, Feldman Ekopark, Kharkiv Oblast
Coordinates	50.1038, 36.2667 ¹
Date	On or prior to 20/03/2022
Time	Unknown

Description of the Events

On 20/03/2022 footage surfaced of what appears to be a 9M218 Grad rocket motor impaled in the area of the Feldman Ekopark zoo, known as Alpaca land. The motor impaled itself on the grounds of an alpaca enclosure. The Feldman Ekopark has reportedly been a target of shelling on multiple occasions between 24/02/2022 and 05/05/2022. Satellite imagery indicates shelling of areas close to this incident, however, the exact area affected by the payload of this specific rocket was not established. The exact location of the launch site also was not identified.

Key Findings

- The location of the incident is a zoo, known as “Feldman Ekopark”.
- The Feldman Ekopark and its resident animals have reportedly been the target of shelling on multiple occasions from 24/02/2022 until 05/05/2022, when all animals were reported to have been evacuated.
- On 20/03/2022, footage surfaced of what appears to be a 9M218 “Grad” rocket motor impaled in the area of the Feldman Ekopark zoo, known as Alpaca land. The motor impaled itself on the grounds of an alpaca enclosure.
- Satellite imagery indicates shelling of areas close to this incident.
- Satellite imagery from the period indicates that the area immediately to the north of the zoo could have been used by military units and displays signs of machinery movements.
- The exact area affected by the payload of the rocket was not identified. It is possible the rocket did not explode as intended.
- The exact location of the launch site was not identified.

¹ <https://maps.app.goo.gl/aoxzeDqXn4W8mACH6>

Description of Searches

An internet search was carried out using the following search terms (as well as other more general queries), with the aim of obtaining footage of impact or further evidence of shelling:

- “Обстрел экопарка Харьков”;
- “Feldman Ekopark shelling”;
- “Прилет зоопарк Харьков”;
- “Долина Альпак Харьков”.

The searches were limited to the timeline from 24/02/2022 to 05/05/2022 (From the first report of strike on the zoo, until the reported date of evacuation of all animals).

Background Summary of Significant Descriptive Content

Media Reports

- 1) <https://meduza.io/feature/2022/03/26/mnogie-zhivotnye-pogibli-ot-razryva-serdtsa>²;
- 2) <https://meduza.io/news/2022/04/13/iz-ekoparka-v-harkove-popavshego-pod-obstrel-vyvezli-vseh-zhivotnyh>³;
- 3) <https://www.dailymail.co.uk/news/article-10735017/Workers-stayed-Ukraine-zoo-help-animals-shot-dead-Russians.html>⁴.

NGO Reports

None identified.

Other

Open source analysis indicated that the zoo has been a target of shelling on numerous occasions since the first day of the invasion on 24/02/th of February 2022, a timeline of attacks:

- [24/02/2022](#)⁵;
- [01/03/2022](#)⁶;

² <https://meduza.io/feature/2022/03/26/mnogie-zhivotnye-pogibli-ot-razryva-serdtsa>

³

<https://meduza.io/news/2022/04/13/iz-ekoparka-v-harkove-popavshego-pod-obstrel-vyvezli-vseh-zhivotnyh>

⁴

<https://www.dailymail.co.uk/news/article-10735017/Workers-stayed-Ukraine-zoo-help-animals-shot-dead-Russians.html>

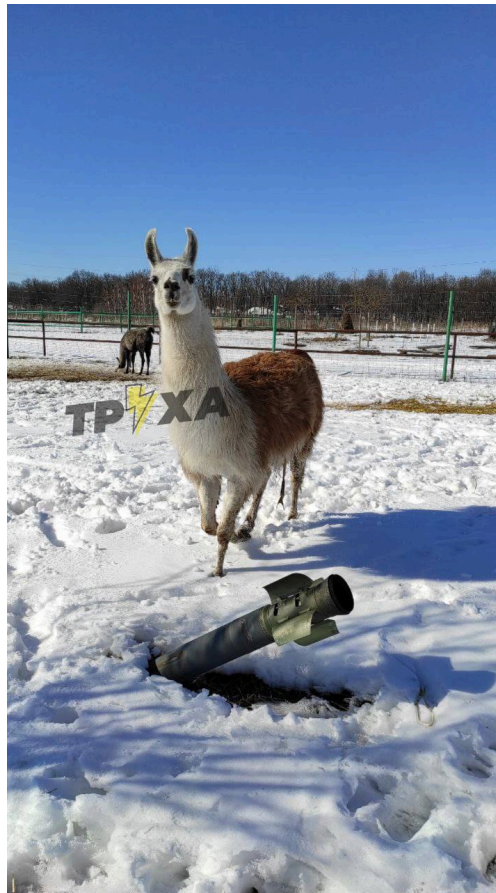
⁵ <https://2day.kh.ua/ru/kharkow/v-kharkove-na-territorii-ekoparka-razorvalis-pyat-snaryadov>

⁶ <https://2day.kh.ua/ru/kharkow/iz-kharkovskogo-ekoparka-sbezhal-krasnye-volki>

- [17/03/2022](#)⁷;
- [19/03/2022](#)⁸;
- [31/03/2022](#)⁹;
- [04/04/2022](#)¹⁰;
- [04/05/2022](#)¹¹.

Analysis of Examinable Content

- [Source 1](#)¹²: - Telegram post with one image (S1I1) of this incident, showing what appears to be a munition embedded into snow-covered ground with a llama standing behind it. Posted on 20/03/2022 to “Труха ⚡ Україна” Telegram channel.



Source 1 Image1 (S1I1) of what appears to be a 9M218 rocket motor and tail section impaled into the grounds of an alpaca enclosure (Telegram: [Tryxa](#)¹³).

⁷ <https://2day.kh.ua/ru/kharkow/vo-vremya-obstrelov-v-kharkovskom-ekoparke-pogibli-primaty>

⁸ <https://2day.kh.ua/ru/kharkow/okkupanty-obstrelyali-kharkovskiy-ekopark-pogibli-oleni>

⁹ <https://focus.ua/voennye-novosti/511034-v-ekoparke-harkova-vo-vremya-obstrelya-pogibli-bizony-foto>

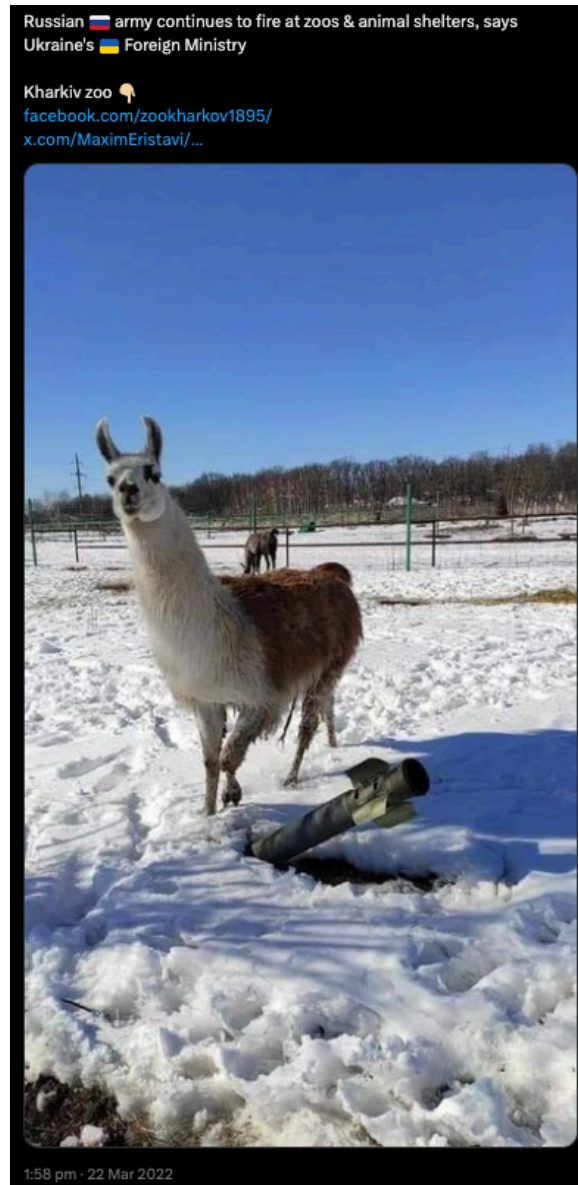
¹⁰ <https://focus.ua/ukraine/511411-ekoparka-pod-harkovom-bolshe-net-aleksandr-feldman-video>

¹¹ <https://focus.ua/voennye-novosti/514540-vs-rf-obstrelyali-ekopark-pod-harkovom-est-zhertvy-video>;
<https://t.me/FastFocus/17952>

¹² <https://t.me/truexanewsua/34977>

¹³ <https://t.me/truexanewsua/34977>

- [Source 2](#)¹⁴: A Tweet containing an image (S2I1) that appears to have been taken almost simultaneously with S1I1 and therefore likely by the same original source. It was posted on 22/03/2022 by journalist Saad Abedine [@SaadAbedine](#). Although this is the source for the incident on the Civilian Harm sheet link, the image is of a relatively low quality. A higher resolution image posted on an earlier date, was identified through conducting a reverse image search. For the purpose of this assessment, the higher resolution image, which is marked as S1I1, will be used as a key examinable content.



Source 2, Image 1 (S2I1) of what appears to be a 9M218 rocket motor and tail section impaled into the grounds of an alpaca enclosure.

¹⁴ <https://twitter.com/SaadAbedine/status/1506238896639823876>

- [Source 3](#)¹⁵: A Youtube video (S3V1) of the “Alpaca Land”. This source is a video depicting a tour around Alpaca Land. Although it does not show the incident itself, it does show the area in which the incident took place. It was posted on Youtube on 31/10/2022 by [Julia Voronaya](#)¹⁶.



A still from a Youtube video (S3V1) depicting an alpaca enclosure in the “Feldman Ekopark” zoo “Alpaca Land”.

Questions to Investigate:

Where Was the Incident?

The incident can be geolocated to [50.1038.36.2667](#)¹⁷. The location is known as “Alpaca Land” at the Kharkiv “Feldman Ekopark” zoo. This location was identified using [this video](#),¹⁸ which captures a large part of the “Alpaca Land”, including the area immediately next to where this rocket remnant impacted.

¹⁵ <https://www.youtube.com/watch?v=dU9TBjTy-Uo>

¹⁶ <https://www.youtube.com/channel/UCpa2I3hnBo4xn6Bd21qtNMQ>

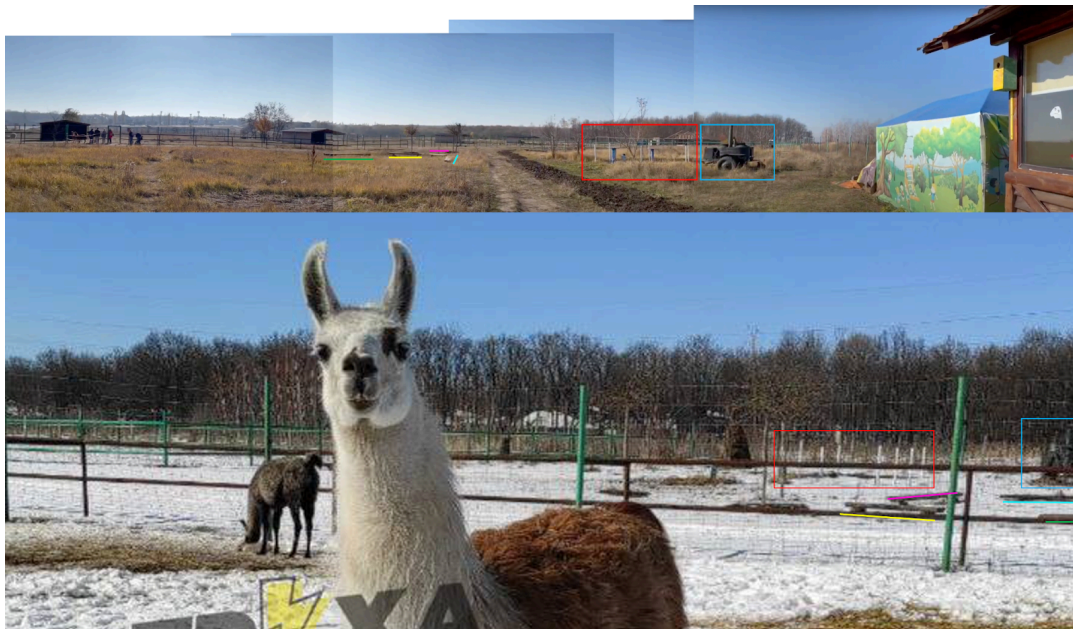
¹⁷ <https://maps.app.goo.gl/JJDkCX579kvVhVDp6>

¹⁸ <https://www.youtube.com/watch?v=dU9TBjTy-Uo>



Top: A composite panoramic of still images from S3V1. Bottom: Planet Labs imagery of this location on 29/05/2022 showing the viewpoint of the panoramic above (Credit: Planet Labs).

The “Alpaca Land” video also depicts features which can be seen in the S1I1.



Top: A composite panoramic of still images from S3V1. Note the benches marked with coloured straight lines, white sapling protectors indicated by the red box and some type of heavy machinery indicated by the blue box. Bottom: A zoomed in and cropped picture from S1I1. Note the same features are visible in the background, although the machinery is partially obscured.

The details within the S1I1 allow us to place this image with a high degree of accuracy. The details observable in the background of S1I1 allow to orientate and roughly place the location of the incident.

However, the shadow of a tree is also evident in the foreground of both S1I1 and S2I1. There is only a single tree in this field, which is consistent with the orientation of the background details. Satellite imagery on Google Earth Pro and Planet Labs was checked from 2017 until the time of writing this report, in order to identify if any other trees or shrubs could be responsible for this shadow. None could be identified.

Therefore, this tree shadow allows us to place the impact location of the rocket to within a few meters of [50.1038, 36.2667](#)¹⁹.



Left: Planet Labs image from 20/05/2022 with the tree highlighted (Credit: Planet Labs). Note that due to the time of day, the shadow of the tree in the Planet Labs imagery is to the south-east, rather than the east, as depicted in the S1I1. Right: Shadow of tree in S1I1.

When Was the Incident?

Date

S2I1, which was linked in the CIVHARM sheet, was posted on Twitter on 22/03/2022. However, S1I1, an almost identical image, taken from what appears to be the same position in the same weather conditions with a llama in the same position, was posted on 20/03/2022 on Telegram.

¹⁹ <https://maps.app.goo.gl/JJDkCX579kvVhVDp6>

An attempt was made to obtain satellite imagery of the incident for 19/03/2022 and 20/03/2022, with the aim of comparing the two and identifying the date of the incident.

No relevant satellite imagery is available for 19/03/2022 and 20/03/2022 due to a cloud coverage of the area. Satellite imagery was obtained for 18/03/2022, and, while this imagery displays heavy signs of shelling of nearby areas, the area in question does not seem to be affected by this date. Historical weather data was sought in order to accurately assess dates of snowfall, but could not be located.

Hence, with the available data it can be concluded that the incident must have occurred on or prior to 20/03/2022.

Time

The time of the incident could not be confirmed. No footage of the incident occurring was identified, therefore the time of occurrence could not be accurately assessed. Since the first identified report of the incident occurred at 17:15 EET on 20/03/2022. It is concluded that the strike had to occur prior to 17:15 EET on 20/03/2022.

What Was Damaged?

No damage could be identified as a direct result of this strike.

What Kind of Munition Was Used?

A potential identification of the rocket motor was conducted by matching its features with reference photos available on [CAT-UXO](https://cat-uxo.com)²⁰.

²⁰ <https://cat-uxo.com/explosive-hazards/rockets/122mm-grad-9m218-rocket>



Left: 9M218 “Grad” reference picture (Credit: [CAT-UXO](#)²¹). Right: S1I1.

The tail of the rocket appears to match that of a 122mm 9M218 rocket as seen on [CAT-UXO](#)²².

The match was made possible by analyzing the vent holes of the rocket motor in both pictures. The 9M218 features a vent hole layout with 2 evenly spaced vent holes. By analyzing “Grad” as well as “Smerch” and “Uragan” reference photos available on [CAT-UXO](#)²³, it is concluded that the 9M218 “Grad” matches the characteristics of the rocket motor seen in the source image.

However, while this analysis strongly indicates this is indeed the cargo section of a 122 mm rocket, there are several different types of 122 mm rockets with extremely similar tails. As such, it was not possible to make a definitive conclusion as to exactly what type of 122 mm rocket this was.

[The range](#)²⁴ of a 122mm rocket is reported to be up to 40 km.

Is There Any Evidence of the Direction the Munition Came from?

Using the identified position of the rocket motor, it was assessed that the tail of the rocket was pointing roughly on a bearing of 88 degrees from North.

²¹ <https://cat-uxo.com/explosive-hazards/rockets/122mm-grad-9m218-rocket>

²² <https://cat-uxo.com/explosive-hazards/rockets/122mm-grad-9m218-rocket>

²³ <https://cat-uxo.com/explosive-hazards/rockets/122mm-grad-9m218-rocket>

²⁴

https://weaponsdocs.files.wordpress.com/2015/02/the_conventional_weapons_threat_to_land_forces_in_afghanistan-u.pdf



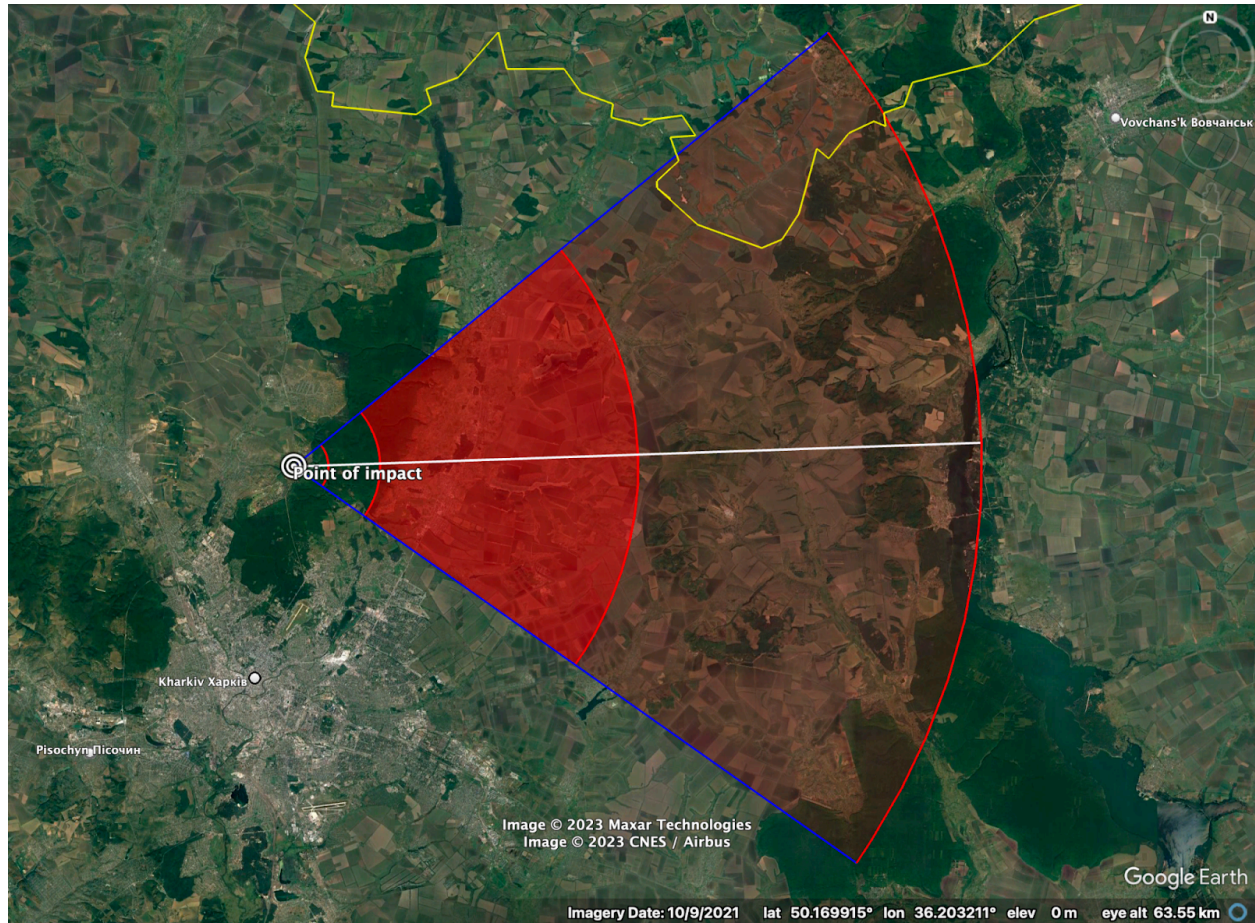
Left: Planet Labs image from 20/05/2022 (Credit: Planet Labs). Right: Shadow of the tree in S1I1. Arrows mark the assessed approximate direction of origin of the rocket.

The range of the 122mm ammunition for the BM-21 MLRS varies depending on the type. On average, the range of a Grad rocket is [reported](https://aoav.org.uk/2021/what-is-a-grad/)²⁵ between 5km and 20km. The absolute range of a Grad rockets is [reported](http://characterisationexplosiveweapons.org/studies/annex-a-122-mm-mbrl/)²⁶ between 2 km and 40 km. Grad systems usually fire rockets from [distances](http://characterisationexplosiveweapons.org/studies/annex-a-122-mm-mbrl/)²⁷ close to their maximum range of 20km. Since it is not possible to identify the type of the Grad rocket depicted at the scene, both the absolute and average range will be reflected on the satellite imagery to cover the use of all possible variants of Grad rocket modifications.

²⁵ <https://aoav.org.uk/2021/what-is-a-grad/>

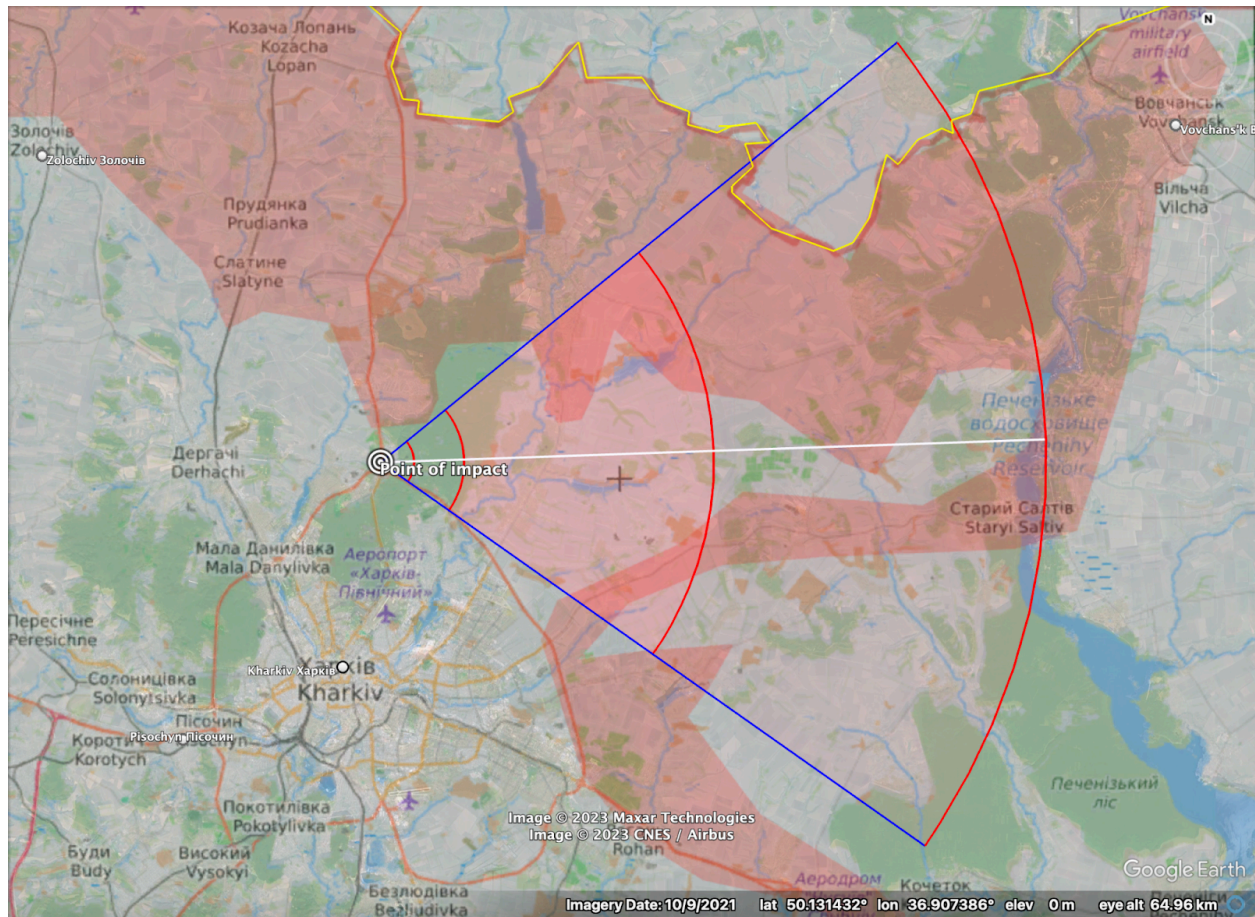
²⁶ <http://characterisationexplosiveweapons.org/studies/annex-a-122-mm-mbrl/>

²⁷ <http://characterisationexplosiveweapons.org/studies/annex-a-122-mm-mbrl/>



Satellite imagery from Google Earth Pro with 2, 5, 20 and 40 km arcs plotted in the likely direction of origin (Credit: Google/Maxar Technologies/CNES/Airbus).

The possible area of origin for this rocket includes areas reportedly controlled by both Ukraine and Russia around the date of the incident.



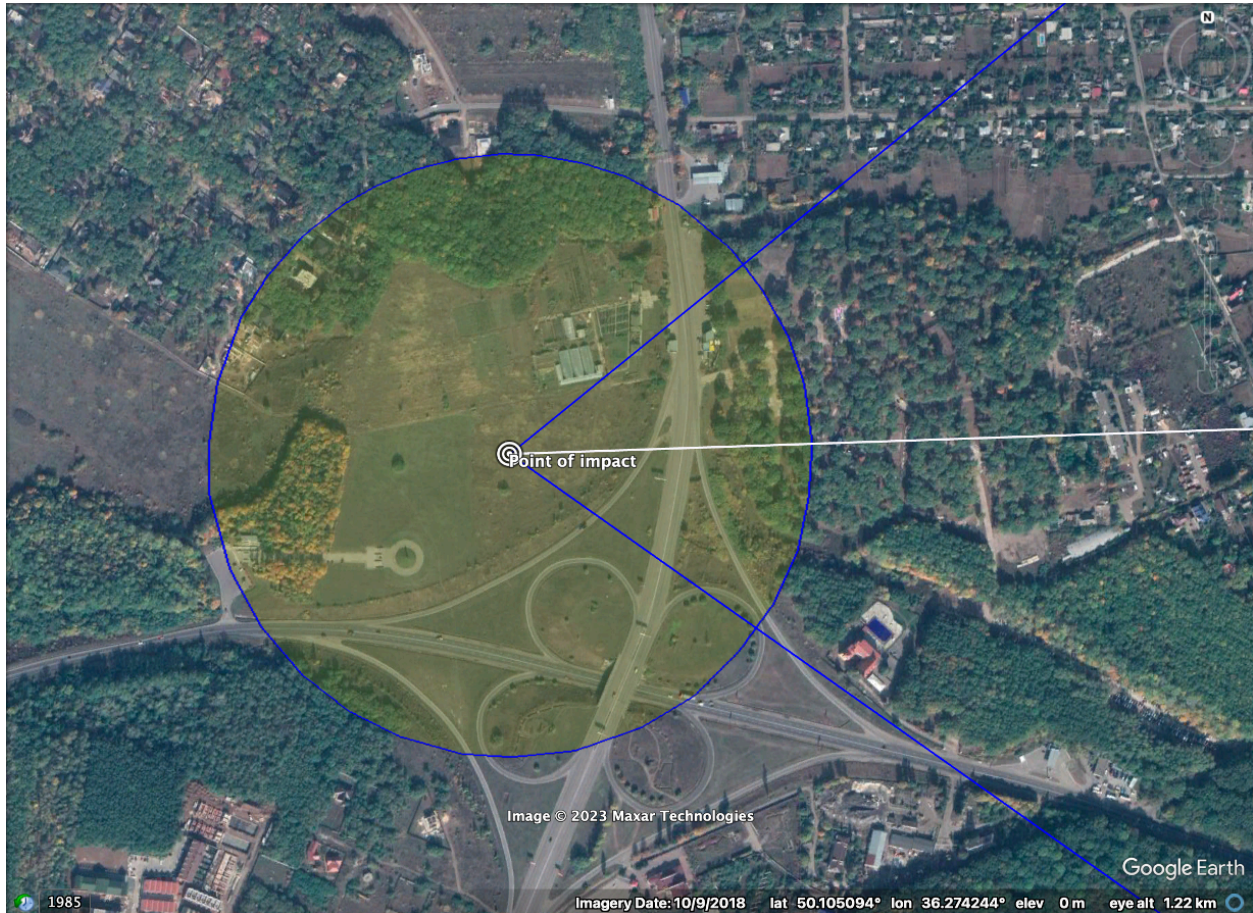
Map of areas under Russian control on 20/03/2022 (Credit: [Liveuamaps](https://liveuamap.com/en/time/18.03.2022)²⁸).

Based on results of computer modeling available in open sources, a salvo of 40 HE Grad rockets creates a [lethal area](#) of 36 hectares (600 m x 600 m)²⁹. A circle of 36 hectares was placed around the point of impact in an attempt to identify the potential target for this rocket.

²⁸ <https://liveuamap.com/en/time/18.03.2022>

²⁹

<http://characterisationexplosiveweapons.org/studies/annex-a-122-mm-mbrl/#:~:text=The%20BM%2D2%20was%20introduced,et%20al.%2C%202013>



Likely targeted area highlighted in yellow, centered on the point of impact (Credit: Google/Maxar Technologies).

Are There Any Indications of What the Location Was Being Used for?

The area targeted is largely occupied by the “Feldman Ekopark” Zoo, while residential areas are located on either side of the zoo. The zoo features an area which is called “Alpaca Land”, which is the exact location of the impact of the rocket motor. A highway runs across this area. Notably, the “Holodomor victims memorial” is located approximately 200 m south-west of the incident.

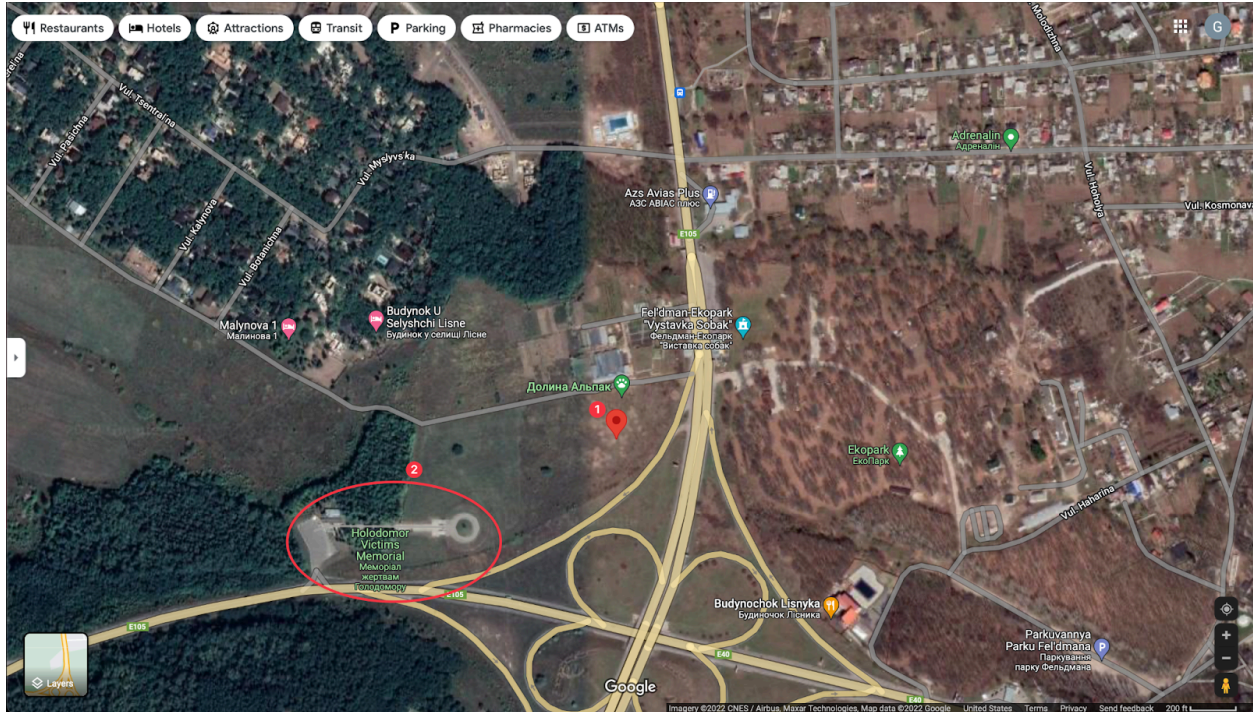


Image of the location of the incident, with “Holodomor Victims Memorial” marked ([Google Maps](https://goo.gl/maps/ddNZKYxgN3tNHai6)³⁰)

Were There Military Structures, Installations or Other Assets in the Area?

On 18/03/2022, the area outlined in the satellite imagery below displays signs of vehicle movement, with tracks moving into the forested area. It is unknown if these marks were left by military related movements. In satellite imagery from 10/03/2022 from Planet Labs, these signs of movement were not present.

³⁰ <https://goo.gl/maps/ddNZKYxgN3tNHai6>



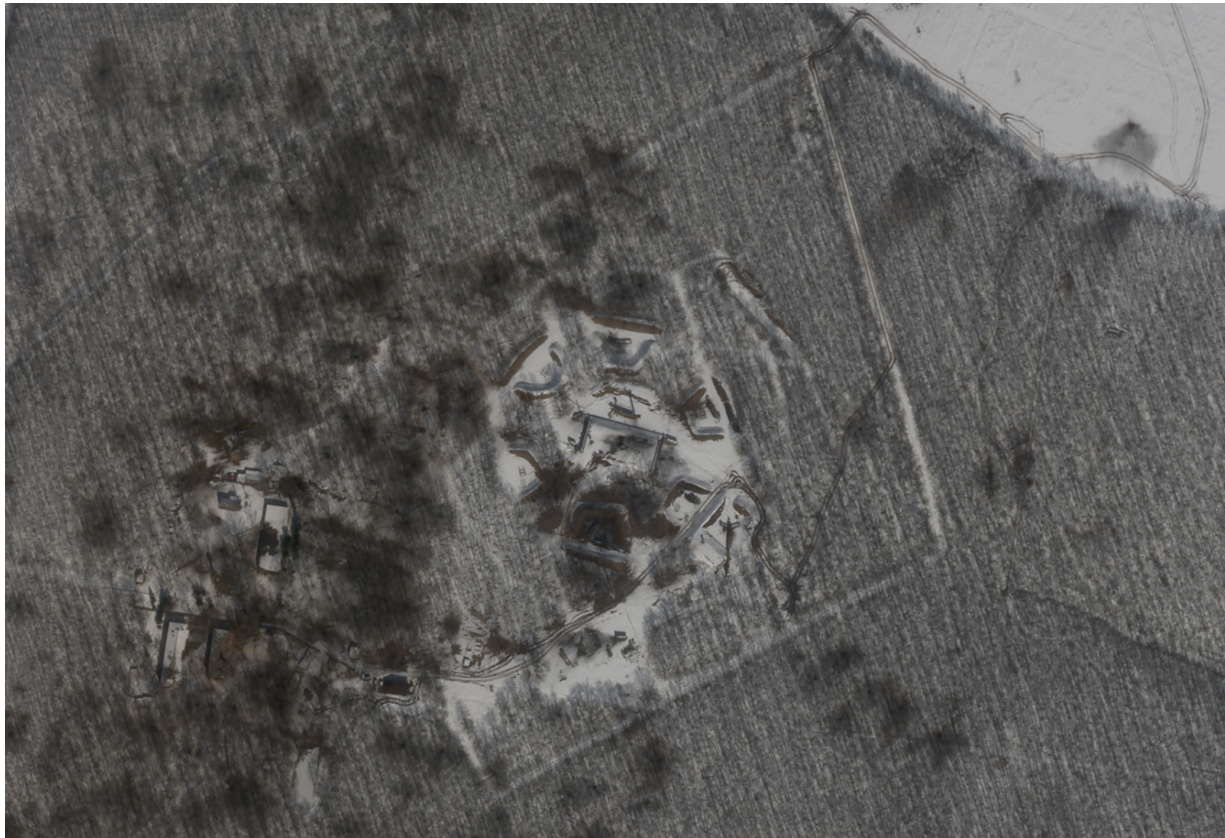
Satellite image from Planet Labs, 18/03/2022 (Credit: Planet Labs). The marks are highlighted by a red circle.



Satellite image from Planet Labs, 18/03/2022 (Credit: Planet Labs).

The area to the north of the incident displays signs of heavy shelling. The area is primarily residential, and no industrial objects were identified through open source analysis. No military objects could be identified in the immediate vicinity of the incident.

There is an unidentified structure, around 1 km north ([50.1252, 36.2742](https://goo.gl/maps/GsgHyekk167JzohH6)³¹) of the incident. This structure appears to be military in nature as it resembles fortifications on its sides. Furthermore, there are signs of movement around the structure, and signs of heavy shelling.



Unidentified object 1 km north of the incident, image from 18/03/2022 (Credit: Planet Labs).

³¹ <https://goo.gl/maps/GsgHyekk167JzohH6>



Close up satellite image of what appear to be industrial warehouses from 18/03/2022 (Credit: Planet Labs).

Furthermore, there is a location, which has been identified as an industrial warehouses: [“Nvk Tekhnolohiya Pidymu”](#)³². Satellite imagery from 18/03/2022 shows that this area had been heavily affected by shelling by 18/03/2022. The size and number of the craters seen here indicate that this area may have been affected by heavy shelling.

³² <https://goo.gl/maps/WYdjPrj48ZkGHd6Q6>



Satellite imagery from 18/03/2022 (Credit:Planet Labs). Markings: 1. Incident location; 2. Unidentified object; 3. Industrial equipment warehouse.

Statements from Parties of the Conflict

Ukraine

- Mihail Feldman - People's Deputy of Ukraine and owner of the "Feldman Ekopark" [states](#)³³ that the Ekopark "does not exist anymore" after the shelling on 04/04/2022.

Russia

- Kremlin spokesperson Dmitry Peskov, [denies](#) cluster munitions use in Ukraine.

Conclusion

On or before 20/03/2022, a 122 mm rocket was fired at the area of the "Feldman Ekopark Zoo" with the rocket motor landing inside an alpaca enclosure in an area called "Alpaca Land". The rocket likely originated from up to 30 km away in the north-easterly direction. The location of the incident has been a target of shelling since 24/12/2022, with the latest casualty reported on 05/05/2022.

The area has been reportedly targeted on a number of occasions. While satellite imagery indicates that military movements may have been occurring in the area prior to the incident, it was not possible to identify these movements. The rocket motor seen on imagery is in good enough condition to establish the approximate direction of travel. Furthermore, the probable area of launch matches with areas which have been reported as being under Russian control at the same period.

Further Action

Conduct further internet search to identify impact footage.

³³ <https://focus.ua/ukraine/511411-ekoparka-pod-harkovom-bolshe-net-aleksandr-feldman-video>