

Incident Assessment

Incident ID	CIV0336
Location	Nemyshlianskyi district, Kharkiv
Coordinates	49.9653, 36.3457 ¹
Date	11/03/2022
Time	No later than 13:27 EET

Description of the Events

No later than at 13:27 EET on 11/03/2022, the cargo section of a 9M55K cluster munition rocket impacted into the football field located in the residential area of Nemyshlianskyi district in Kharkiv, Ukraine. The earliest identified visual materials of the cargo section were posted online on 11/03/2022 at 13:27 EET (Source 2, Image 1 (S2I1)). The latest available visual materials of the cargo section were posted on 12/03/2022 at 14:35 EET (Source 1 Image 1 and Video 1 (S1I1 and S1V1)). At the time of the incident, it was reported that in the same district a civilian car, a tobacco kiosk, and road infrastructure were shelled, indicating a possible link between these incidents. It was reported that adjacent districts (Industrialny, Saltivka) were shelled on the same date.

Key Findings

- **Munition:** Identified as what appears to be a 9M55K cluster munition rocket, based on the cargo section.
- **Main Incident location:** Football/sports field in a residential area of Nemyshlianskyi district of Kharkiv, Ukraine.
- **Associated Incident location:** Intersection in a residential area of the Nemyshlianskyi district in Kharkiv, ~900m from the Main Incident towards north/northeast.
- **Possible launch site:** Not identified.
- **Estimated direction of origin:** South/SouthWest.
- **Incident date and time:** 11/03/2022, no later than 13:27 EET.
- **Possible associated event/damage:** There is a possible link to reported damage at the intersection in a residential area of the Nemyshlianskyi district of Kharkiv approximately 900m from the Main Incident's location to the north. Social media posts depicted damage sustained by a civilian vehicle and pedestrian traffic light near 'АТТИКА' tobacco kiosk and 'Купонучи' vending kiosk reported on 11/03/2022.

¹ <https://maps.app.goo.gl/tCHxJPbW8buh1FzeA>

- **Nearby military object(s):** No military objects (infrastructure, troops, weaponry) were identified within 1 km of the Main Incident in both North/North-East and South/SouthWest directions.
- **Nearby civilian object(s):** (1) Within 1 km towards the North/North-East from the location of the Main Incident there is a cluster of industrial-grade chemical production and supply facilities ('Kharkivs'kyi Avtohenyy Zavod' (Acetylene Factory), 'KHIMSNABZHENIYE', 'HIMPROM', KHARKOVREAKHIM, NOVOKHIM), 'EKSIMMASH' Industrial Equipment Factory, 'Solodkyy Svit' Confectionery Factory, a garage cooperative, and a 'BVS' gas station. (2) Within 1 km towards the South/SouthWest, residential buildings, warehouses and civilian infrastructure were identified.

Description of Searches

In order to identify the earliest User Generated Content ('UGC') posts in open sources containing identical imagery or visual materials taken at the same location, as well as any other relevant visual materials that could be linked to the incident depicted on S1I1, S1V1, and S2I1, multiple reverse image searches and textual search queries were carried out. Words describing location and depicted objects, such as 'Kharkiv', 'Saltivka/Saltovka', 'Nemyslyanskyi', 'Shelling', 'Strike', '9M55K', 'Cargo Section', 'Playground', 'Football Field', 'Kids', 'Residential Area' and their combination in English, Russian and Ukrainian were used. Searches were done on Google and Yandex search engines, as well as popular social media platforms (Twitter, Telegram and TikTok).

Additionally, numerous search queries were undertaken to identify any general information relevance to the present assessment, including past weather forecasts and media reports covering the ongoing armed conflict and associated events, with relevant results subsequently collected and analysed in this assessment.

Geolocation. This search was conducted using various combinations of words, phrases and geographic locations in English, Russian and Ukrainian, with a reference to distinctive natural and human-made objects visible on the image. Examples included:

- "Football field", "Soccer Field", "Футбольное поле", "Футбольне поле";
- "Children playground", "Детская площадка", "Дитячий майданчик";
- "Sports ground", "Спортивная площадка", "Спортивний майданчик".

Choronolocation. Additional textual and reverse image search queries were undertaken to establish the height of the basketball hoop pole using various combinations of the following keywords and phrases in English, Russian and Ukrainian. Examples included:

- "Basketball hoop outdoors equipment Ukraine", "Баскетбольное кольцо уличное оборудование Украина", "Баскетбольне кільце вуличне обладнання Україна";
- "Basketball pole outdoors equipment Ukraine", "Баскетбольная стойка уличное оборудование Украина", "Баскетбольна стійка вуличне обладнання Україна";

- “Streetball pole outdoors equipment Ukraine”, “Стойка стритбол уличное оборудование Украина”, “Стійка стрітбол вуличне обладнання Україна”.

Background Summary of Significant Descriptive Content

Media Reports

- [NV.UA](#)² (Ukrainian online news media reporting on events concerning Ukraine).

14:43 EET 10/03/2022

Publication reports that Russian armed forces made 74 artillery strikes on Kharkiv during March 9, 2022, including 29 artillery strikes made after nightfall. Damage was reported in several central districts of Kharkiv, including the North Saltivka and South Saltivka districts (located at [49.9963, 36.3183](#)³).

- [Objectiv.tv](#)⁴ (Ukrainian online news media reporting on events concerning Ukraine).

12:07 EET 11/03/2022

Publication reports of a rocket hitting an apartment building, causing the death of a woman. Reported damage occurred at Heroiv Pratsi Street in Kharkiv ([50.0239, 36.3365](#)⁵), ~6.2km to the North/NorthEast from the location of the cargo section.

NGO Reports

- [Human Rights Watch](#)⁶ (HRW)

06:00 EET 04/03/2022

According to the HRW report, “at least 15 consecutive explosions in a residential street that are consistent with submunitions” occurred on February 28, hitting several cars in the Industrialnyi district ([49.9340, 36.3975](#)⁷) of Kharkiv, which is adjacent to the eastern part of the Nemyshlianskyi district in Kharkiv.

Other

- [UN Office of the High Commissioner for Human Rights](#)⁸ (OHCHR)

13/03/2022

According to the report, at the time of the incident, several regions of Ukraine were under control of the Ukrainian government, including Kharkiv; 968 casualties occurred (459 killed

²

<https://nv.ua/kharkiv/obstrely-harkova-9-marta-rossiyane-bili-iz-artillerii-rszo-novosti-harkova-50223767.html>

³ <https://maps.app.goo.gl/DCjx8PYPqMXakjAd9>

⁴

<https://www.objectiv.tv/objectively/2022/03/11/na-geroev-truda-snaryad-vs-rf-popal-v-mnogoetazhku-umerla-zhenshhina-foto/>

⁵ <https://maps.app.goo.gl/ErTkqmkUzNAiC6pk9>

⁶ <https://www.hrw.org/news/2022/03/04/ukraine-cluster-munitions-launched-kharkiv-neighborhoods>

⁷ <https://maps.app.goo.gl/rAGP4zGNfjiTWzhL6>

⁸ <https://ukraine.un.org/index.php/en/174664-ukraine-civilian-casualties-2400-12-march-2022>

and 509 injured). Most of the civilian casualties reported were caused by the use of explosive weapons, including shelling from heavy artillery and multi-launch rocket systems, and missile and air strikes.

Analysis of Examinable Content

The CIVHARM sheet contains a single photo of the incident that was published on [Twitter](#)⁹ on 12/03/2022 at 15:04 EET with the caption “*Meanwhile in Kharkiv*”. The earliest available post with the identical photo was identified as being posted on Telegram (see **Source 2** below).

- **SOURCE 1**

URL: <https://t.me/truexanewsua/32370>¹⁰

Date: 12/03/2022 at 14:35 EET

Caption: *In Russian:* “Какие времена, такие и тренды в тик-токе 🤖” [meaning: “TikTok trends correspond to the times people live in”]



S1I1.

A photo depicting a minor embracing a metal object whose shape resembles the cargo section of a 9M55K cluster munition rocket, which impacted snowy ground outdoors.

The red basketball hoop and shield on a tall blue pole are partially visible in the top left corner of the photo. The V-shaped trunk of a tree is visible in the middle right part of the photo.

On the top, a building with a gable type roof with a chimney pipe and an overlay of two houses with a height discrepancy can be observed.

A layer of snow can be observed on the ground and roofs of the depicted residential buildings. Its visible thickness indicates that freezing temperatures might have been present at the time the photo was taken, suggesting winter or early spring as a likely season. The weather is sunny with no observable clouds. The photo has the “TP ⚡ XA” watermark in the middle (“S1I1”).

⁹ <https://twitter.com/loogunda/status/1502631645702197256>

¹⁰ <https://t.me/truexanewsua/32370>



S1V1.

A short video (0:04) depicts the same minor at the same location and date as S1I1 from a slightly different angle and distance. The child leans on the object of identical shape to the one depicted in S1I1. The video further depicts matching objects (vegetation, houses) in a spatial layout matching the one depicted in S1I1. Like S1I1, the video depicts sunny, cloudless weather conditions. The video further provides an extended view of the location, capturing the upper part of the basketball pole and shield depicted in S1I1.

In the background, the video captures what appears to be: striped football goalposts; a street playground or gym visible in the top left corner of the video; and a row of trees with thin trunks. Like S1I1, the video has a “TP ⚡ XA” watermark (“S1V1”).

- **SOURCE 2**

URL: <https://t.me/truexanewsua/31951>¹¹

Date: 13:27 EET 11/03/2022

Caption: *In Russian:* “Последствия обстрела Немышлянского района, Салтовка, Харьков” [“The aftermath of shelling of Nemyshlyansky district, Saltivka, Kharkiv”]

¹¹ <https://t.me/truexanewsua/31951>



S2I1.

A photo depicts an object whose shape resembles the cargo section of a 9M55K cluster munition rocket which impacted the snowy ground outdoors, in the vicinity of a V-shaped trunk of a tree visible in the top left corner. The ground impacted by the cargo section is covered with a layer of snow. The cargo section, the tree and what might be the top part of the basketball hoop shield seen on S1I1 and S1V1 (depicted in the top left corner of the photo) cast clear shadows, indicating sunny weather conditions at the time when the photo was taken. The photo has the “TP ⚡ XA” watermark (‘S2I1’).

The shape of the munition, the angle of its inclination, the shape of the crater underneath, and the shape of the tree trunk indicate that this photo was likely taken at the same location as S1I1 and S1V2.



S2I2.

S2I2 and S2I3 depict the damage sustained by a VAZ2105 or VAZ2107 car: dents and peeling paint are visible across the car’s body on its right front door, rear (trunk) and front (hood) sides, as well as its windscreen and right front window. The car is depicted on a pavement near a metal garbage bin between two street kiosks with glass windows. No damage is visible on vending kiosks. A damaged, torn-out traffic light is depicted on the ground near the car. Patches of ice and snow are visible on the pavement and the road. Reflected sunlight on the car’s body indicates sunny weather conditions. Both photos depicting the car have the “TP ⚡ XA” watermark (‘S2I2’ and ‘S2I3’).



S2I3.



S2V1.

A video of a black smoke seen rising in the far distance. The rusty metal gates and brick fence are visible in the video. The visible thickness of the snow layer indicates that freezing temperatures were present at the time the photo was taken, suggesting winter or early spring as the likely season. The video, made in what appears to be a residential area, captures a phrase in Russian: “Пиздец твориться нахуй, Салтовку ебашат до сих пор” [“The fuck is going on, [they] fuck Saltivka still”]. The voice comment suggests that by the time the video was recorded, Saltivka district of Kharkiv had been under strikes or shelling for some time. The weather conditions depicted in the video are sunny with a clear sky and no observable clouds. The video has the “TP ⚡ XA” watermark (‘S2V1’).

Questions to Investigate

Where Was the Incident?

The location of the incident was identified to be a football field in a residential area of the Nemyshlianskyi district of Kharkiv, Ukraine, at [49.9653, 36.3457](#)¹².

Entry CIV0336 in the CIVHARM sheet indicated the coordinates of the incident as [49.9655, 36.3454](#)¹³. An independent geolocation was performed using a series of online searches (See the section ‘Description of Searches’) focusing on Kharkiv as the possible location based on the time of the post, accompanying captions of other posts reposting S1I1 ([1](#)¹⁴, [2](#)¹⁵), and areas of hostilities reported in other open sources during that time. The objects depicted in S1I1 and S1V2 were cross-referenced with objects depicted in satellite imagery and images of the location available on Google Street View service dated 2015.

Distinctive objects at the scene of the incident

A visual examination of the area and objects with distinctive shapes and features depicted in S1V1 indicates that the impacted area appears to be residential, with the impacted location possibly being used as a football field, a children’s playground and/or for other recreational activities.

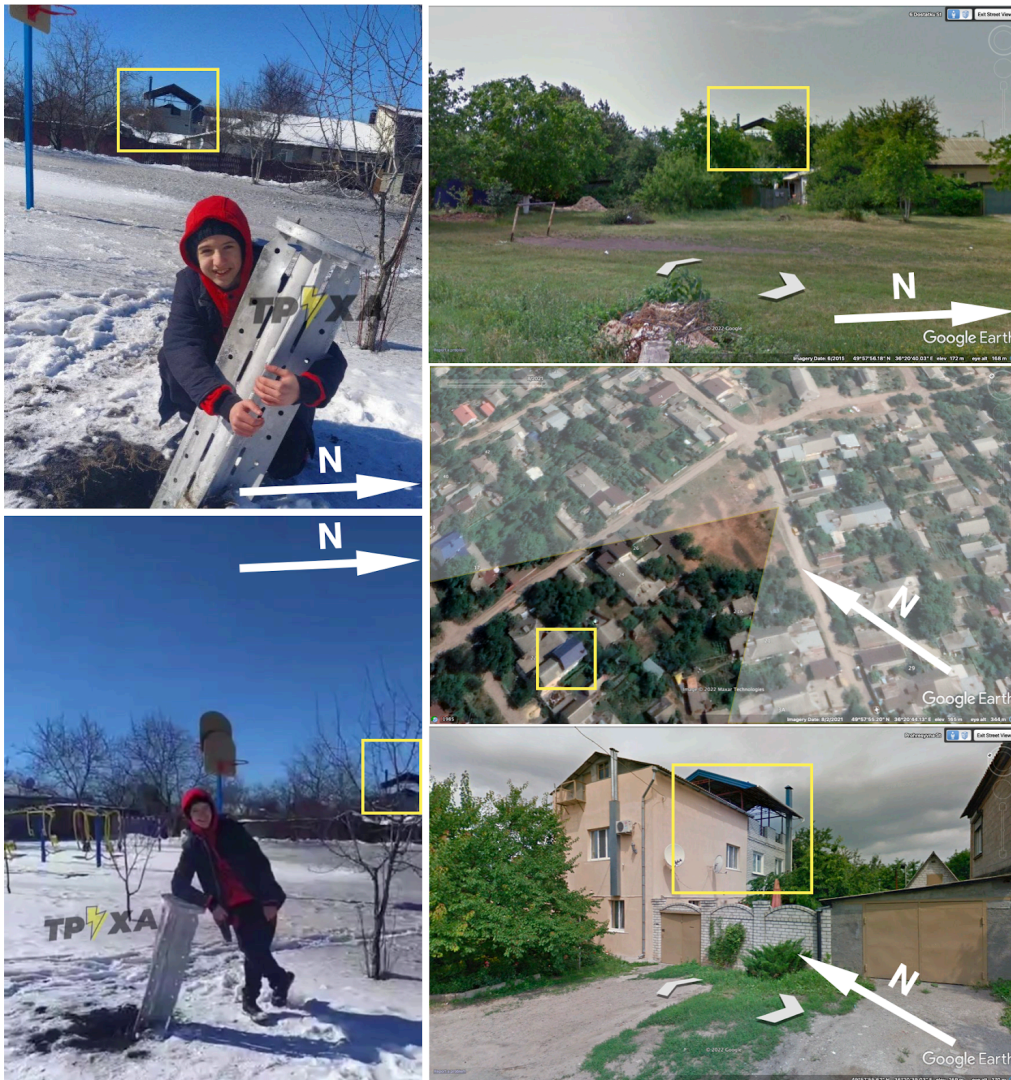
¹² <https://maps.app.goo.gl/hPqk6ZSnByYjRz7S9>

¹³ <https://maps.app.goo.gl/ErNHpkArb7QJzT889>

¹⁴ <https://twitter.com/loogunda/status/1502631645702197256>

¹⁵ <https://twitter.com/RALee85/status/1502769070030131209>

I. A building with a gable roof type with a chimney pipe



Top left: The building with a gable roof type and a chimney pipe (Yellow Box) depicted in S1I1. Bottom left: The same building on S1V1. Top and Bottom right: The building visible in Google Earth Street View images from June 2015. Centre Right: Satellite imagery from 02/08/2021 depicting the same building (Credit: Maxar Technologies/Google Earth Pro).

II. Overlay of two buildings forming a height discrepancy



Bottom: Overlay of two buildings forming a height discrepancy seen on S1I1 (White Box). Top: Satellite imagery from 02/08/2021 depicting the overlay (Credit: Maxar Technologies/Google Earth Pro).

III. Football goalposts

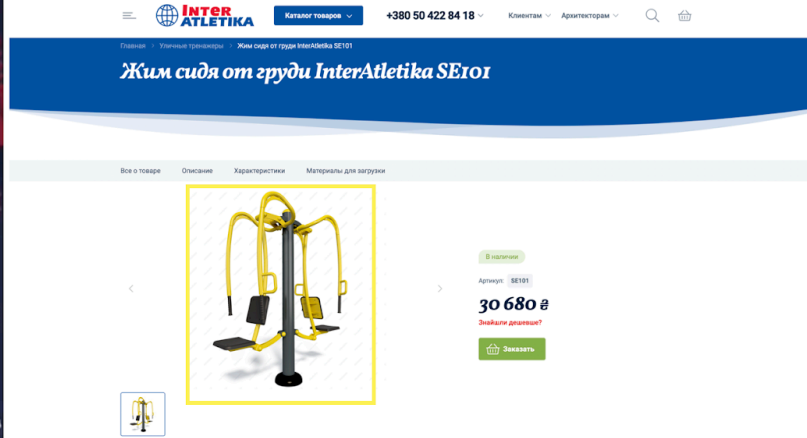


Top: Football goal posts on SiV2 (Yellow Box). Bottom: Football goal posts as seen on Google Street View from June 2015 (Credit: Google Earth Pro).

IV. Basketball hoop with double shield on a pole, street gym and a line of trees



Left: Basketball hoop with a double shield on a pole (White Arrow), a street gym (Yellow Box), and a line of trees (Yellow Arrows) as depicted on S1V2. Top Right: Satellite imagery from 25/05/2021 depicting the same objects. Bottom Right: Satellite imagery from 8/10/2021 (Credit: Maxar Technologies/Google Earth Pro).



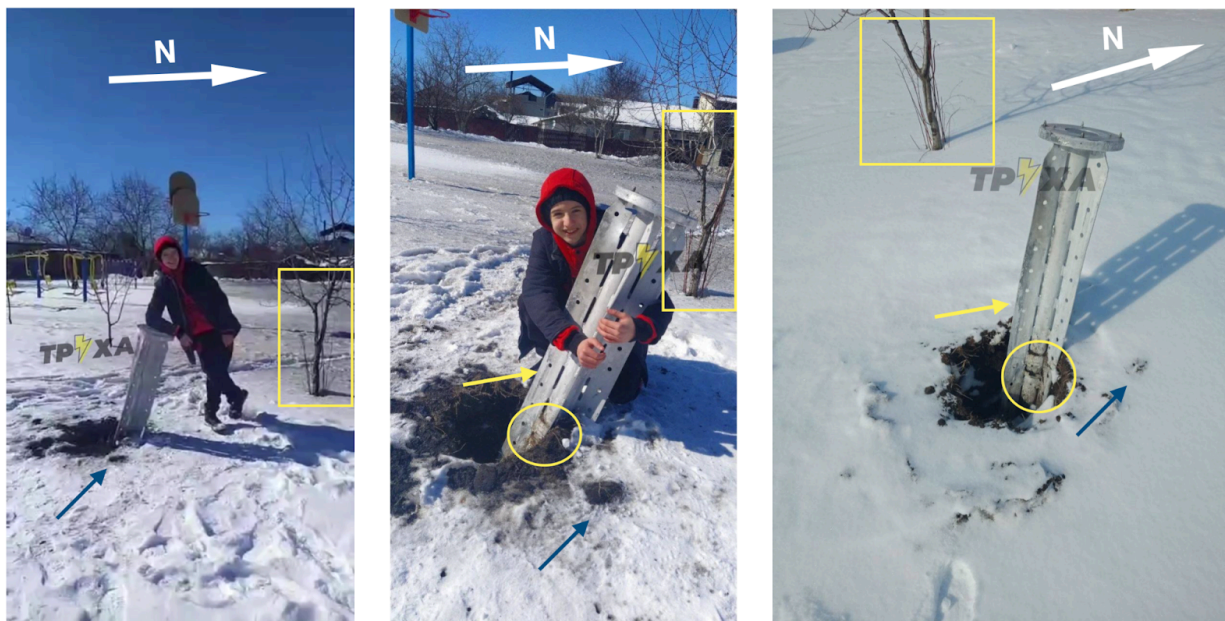
Street gym equipment was identified on the manufacturer's website as InterAtletika SE101 outdoor press seat (Credit: [InterAtletika](https://play.interatletika.ua/ru/zhim-sidya-ot-grudi-interatletika-se101/)¹⁶).

The cargo section depicted at the location of Main Incident on S2I1

S2I1 appears to be taken at the same location as S1I1 and S1V1 based on the following:

- (a) The cargo section's deformation, angle and direction of inclination;
- (b) Shape of the tree trunk;
- (c) Shape of the crater formed at the point of the cargo section's entry.

¹⁶ <https://play.interatletika.ua/ru/zhim-sidya-ot-grudi-interatletika-se101/>



Left: S1V1. Middle: S1I1. Right: S2I1.

Identical shape of the tree trunk (Yellow Box), shape of marks on the cargo section (Yellow Arrow), dirt marks on the cargo section (Yellow Circle), and earth parts around the crater (Blue Arrow)

The date of the post containing S2I1 (11/03/2022), the sunny weather conditions and snow on the ground and the same cargo section embedded in the ground additionally suggest that it was taken at the same location and around the same time as S1I1 and S1V1.

What Area Was Affected by the Submunitions of This Rocket?

No visible damage could be identified in S1I1 and S1V1 taken at the incident's location. Despite information reported in open sources that Nemyshlyanskyi district and Saltivka district of Kharkiv were under artillery shelling and airstrikes at the time of the incident, no information definitively linking the cargo section to a specific area of impact of the submunitions of the 9M55K cluster munition rocket could be identified in open sources at the time of the assessment. Nevertheless, an incident was identified ('**Associated Incident**') in the vicinity of the cargo section located at the football field ('**Main Incident**') which may have a potential link.

Associated Incident

An incident geolocated ~900m from the cargo section was identified in two photos posted on Telegram on 11/03/2022 at 13:22 EET (S2I2, S2I3). S2I2 and S2I3 taken at the location of Associated Incident depict the significantly damaged VAZ2105 or VAZ2107 car and a broken, torn-out traffic light on the pavement in front of two vending kiosks. The Associated Incident could be potentially linked to the Main Incident based on the short distance between them, as

well as an additional photo depicting the cargo section taken at the Main Incident's location (S2I1), the date when they were posted on Telegram, and the depicted weather conditions.

Geolocation of Associated Incident

S2I2 and S2I3 depicting the Associated Incident were posted on 11/03/2022 with a Russian caption “Последствия обстрела Немышлянского района, Салтовка, Харьков” [“The aftermath of shelling of Nemyshlyanskyi district, Saltivka, Kharkiv”]. Slativka district is located in the northern part of the city and adjacent to the Nemyshlyanskyi district. Their proximity mentioned in the S2V1 caption further indicates a possible link between the Main Incident and Associated Incident which helps to narrow down the geolocation area of the Associated Incident.

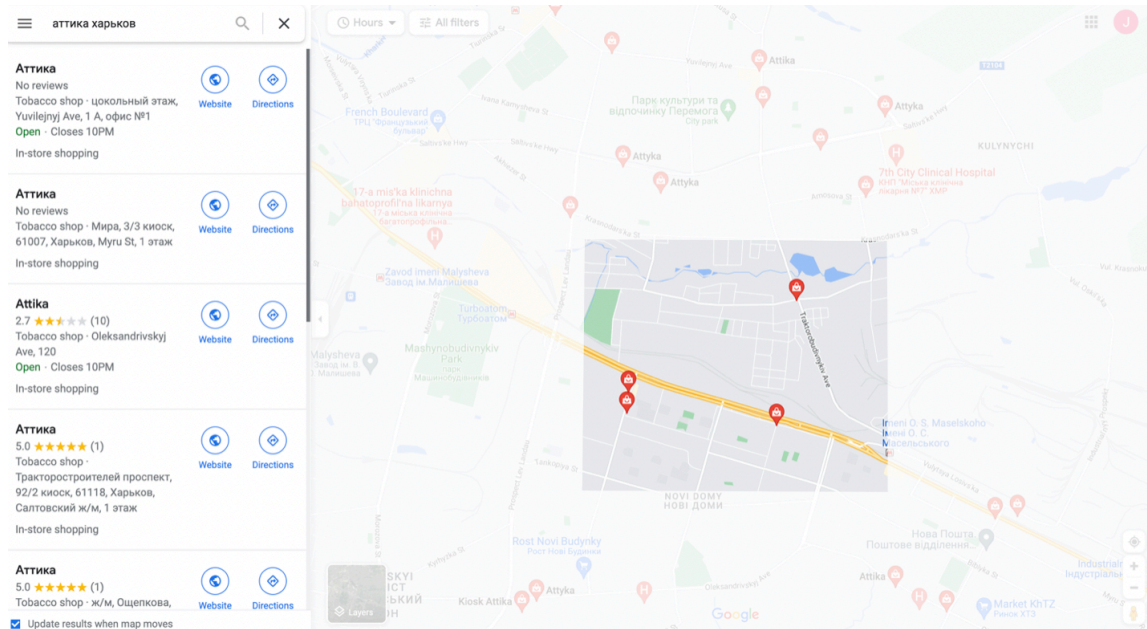
The Associated Incident can be geolocated based on the following information:

1. A Ukrainian sign “АТТИКА” on the vending kiosk (“АТТЮКА”), which belongs to a Ukrainian chain of street tobacco kiosk (Yellow Box);
2. A torn out traffic light which indicated that the kiosk is located in the vicinity of an intersection or pedestrian crossing;
3. Colour palette of the kiosks' exterior elements.



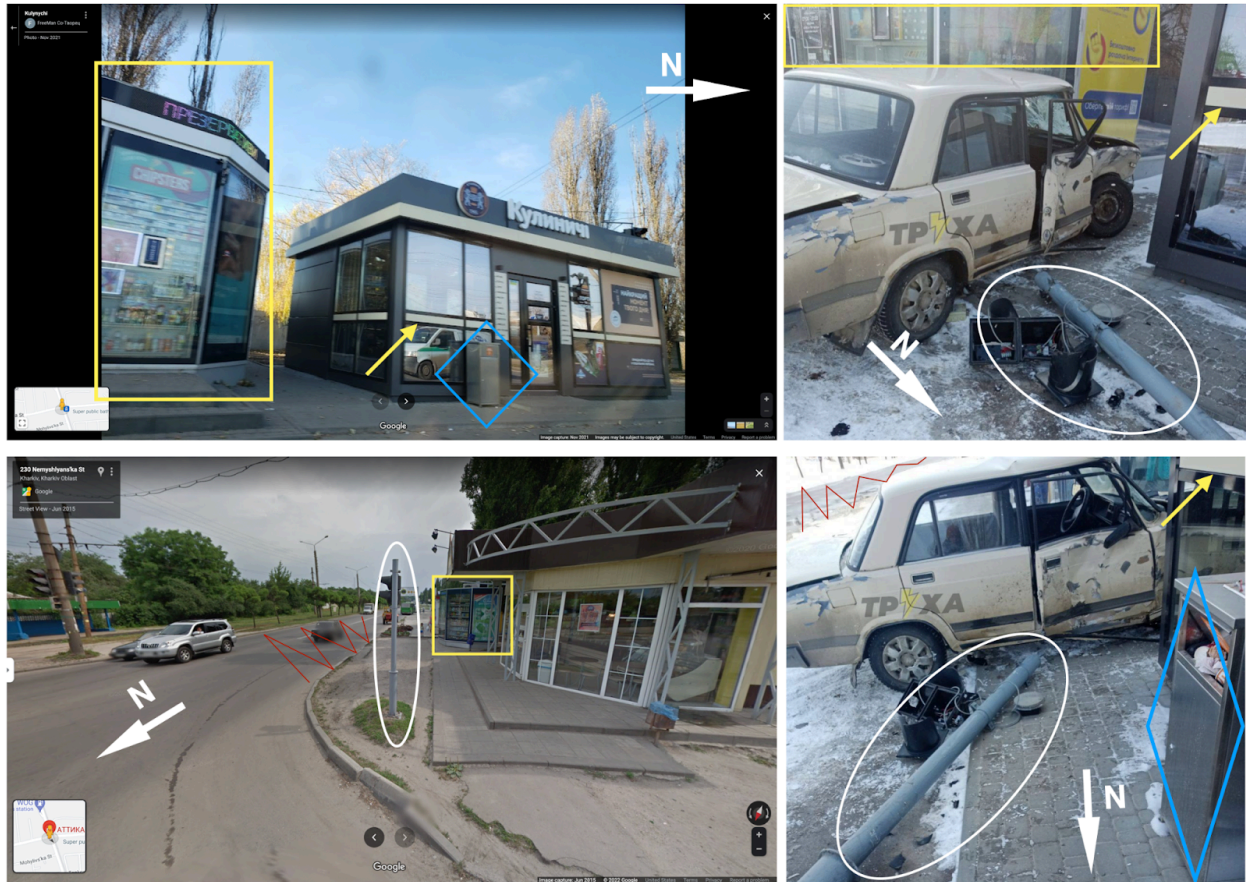
“АТТИКА” sign visible on the glass door of the vending kiosk (S2I2).

Search queries were made on online mapping services to identify the location of the kiosk using the keyword “Аттика”. This identified a chain of tobacco kiosks spread across multiple locations in Kharkiv, with one out of four within 1 km from the location of the Main Incident and identified as depicted on the S2I2 and S2I3.



“АТТИКА” tobacco kiosks identified within 1 km from the location of the Main Incident on Google Maps.

A photo depicting the “АТТИКА” tobacco kiosk and “Кулиничі” vending kiosk uploaded to Google Maps in November 2021 matches the exterior of the kiosks and garbage bin seen on S2I2 and S2I3. Furthermore, a pedestrian traffic light also matches the one seen torn out near the car on S2I2 and S2I3. Finally, the road with a line of trees depicted on S2I2 appears to match the road with a line of trees depicted on Google Street View imagery.



“АТТИКА” tobacco kiosk (Yellow Box), garbage bin (Blue Diamond), torn out traffic light (White Ellipse), exterior of the neighbouring vending kiosk (Yellow Arrow), road and trees (Red Zig Zag).

Therefore, visual examination of the identified “АТТИКА” kiosk, exterior design of kiosks at the location, and layout of transport infrastructure strongly suggests that the Associated Incident depicted on S2I2 and S2I3 took place in the Nemyshlyanskyi district of Kharkiv at [49.9735.36.3460](https://maps.app.goo.gl/b4oyY8mFdsz4YFbd6)¹⁷.

When Were the Incidents?

No information definitively establishing the date and time when the cargo section of a cluster munition rocket impacted the ground at the location of the Main Incident (S1I1, S1V1) was identified in open sources. It was estimated that the cargo section could have impacted the football field no later than **11/03/2022 around 13:00 EET, but in any case no later than 13:27 EET, when S2I1 was posted on Telegram.**

When were the visual materials taken at the location of incidents?

Based on the length and direction of the shadow cast by the basketball pole, it was estimated that S1I1 and S1V1 were likely taken at the location of the Main Incident on **11/03/2022 or**

¹⁷ <https://maps.app.goo.gl/b4oyY8mFdsz4YFbd6>

12/03/2022 between 13:00 and 13:50 EET. In any case, S1I1 and S1V1 could not have been taken later than 12/03/2022 at 14:35 EET, the earliest identified time when S1I1 and S1V1 were posted online.

The weather conditions depicted within the sources further indicate that S1I1, S1V1, and S2I1 could have been taken at the location of the Main Incident based on the archival meteorological information reported in Kharkiv on estimated dates, which was used as a reference.

Chronolocation

I. Main Incident

Estimates of the possible time and date when imagery on S1I1, S1V1, and S2I1 could have been taken are based on:

- (1) the earliest identified date and time when these materials were posted in open sources;*
- (2) weather conditions depicted at the location of the Main Incident;*
- (3) position of the sun established via [SunCalc](https://www.suncalc.org/)¹⁸ based on the length of the shadow cast by the depicted basketball hoop and shield on the pole at the location of the Main Incident.*

The angle at which S1V1 was taken depicts the basketball hoop and shield on the pole casting the shadow perpendicularly to the ground, thus providing a suitable material for chronolocation.

¹⁸ <https://www.suncalc.org/>



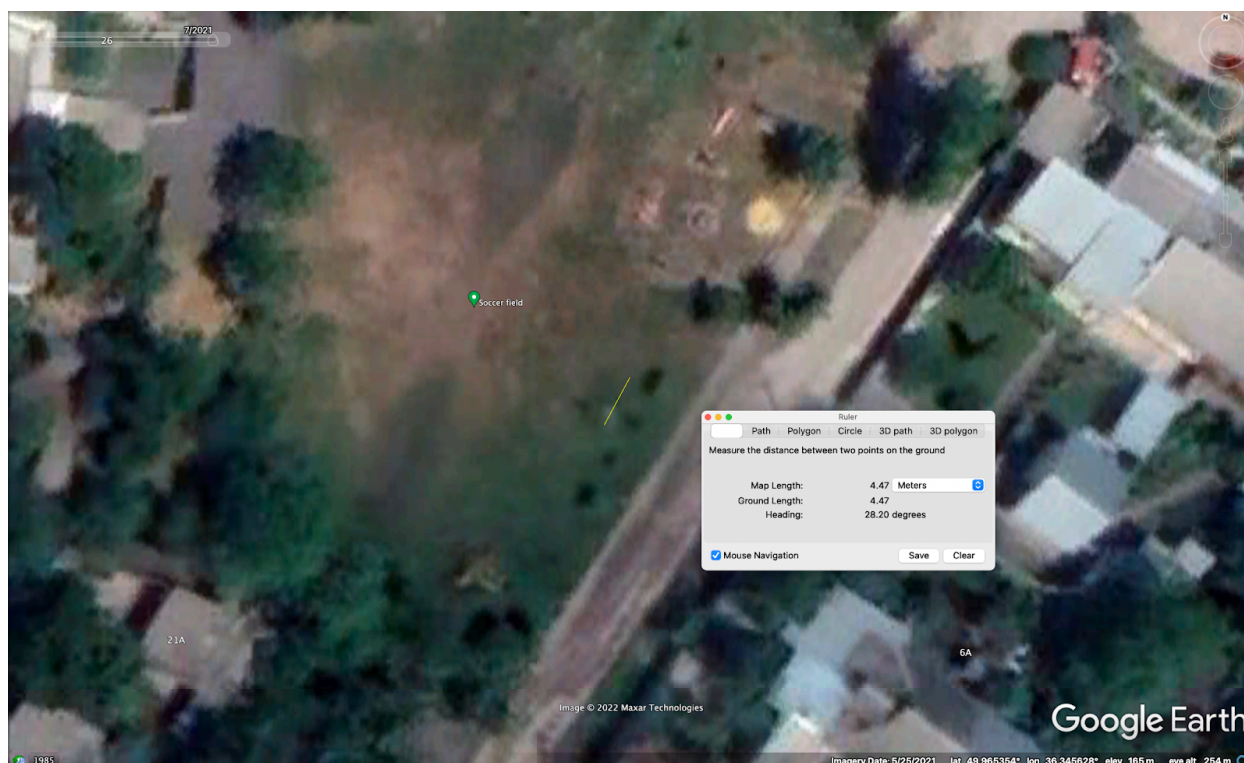
Shadow cast by the depicted basketball pole (Yellow Dotted Triangle) and shield on the pole (Yellow Arrow) as depicted on S1V1.

The still frame from S1V1 captures a basketball hoop pole casting a shadow at a perpendicular angle in a North/NorthEast direction, which is similar to the direction of inclination of the cargo section. The shadow ends at approximately 1.5 m behind the tree depicted on the right side of the picture.



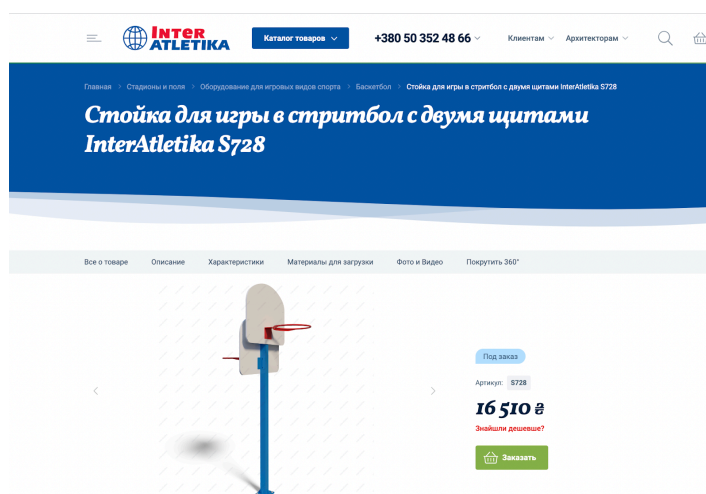
Estimated distance from the tree to the shadow cast by the basketball hoop pole (Credit: Google Earth Pro).

The location of the basketball hoop pole and trees is visible from the satellite imagery; therefore, it is possible to estimate the length of the shadow cast by the basketball hoop pole, which is ~4.47 m.



Estimated length (4.47 m) of the shadow cast by the basketball hoop pole seen from satellite imagery (Credit: Maxar Technologies/Google Earth Pro).

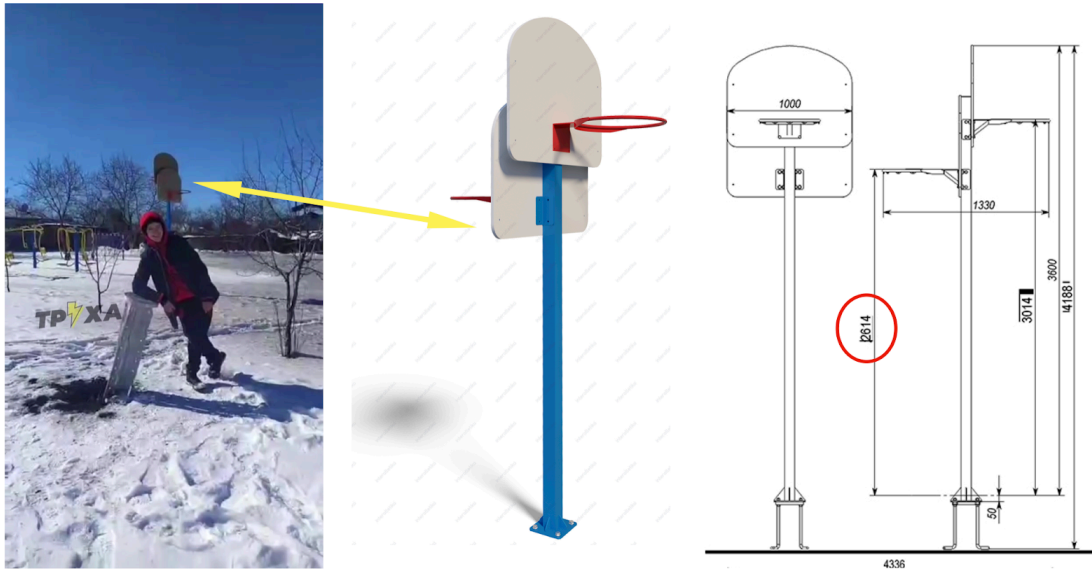
In order to estimate the position of the sun on S1I1 and S1V1, the height measurements of the basketball hoop pole are required. Using reverse image search, the manufacturer of the basketball hoop shield and pole, its model and technical specifications were identified on the manufacturer's website.



Basketball hoop pole model [InterAtletika](https://www.interatletika.com)¹⁹ S728 identified on the manufacturer's website.

¹⁹ <https://www.interatletika.com>

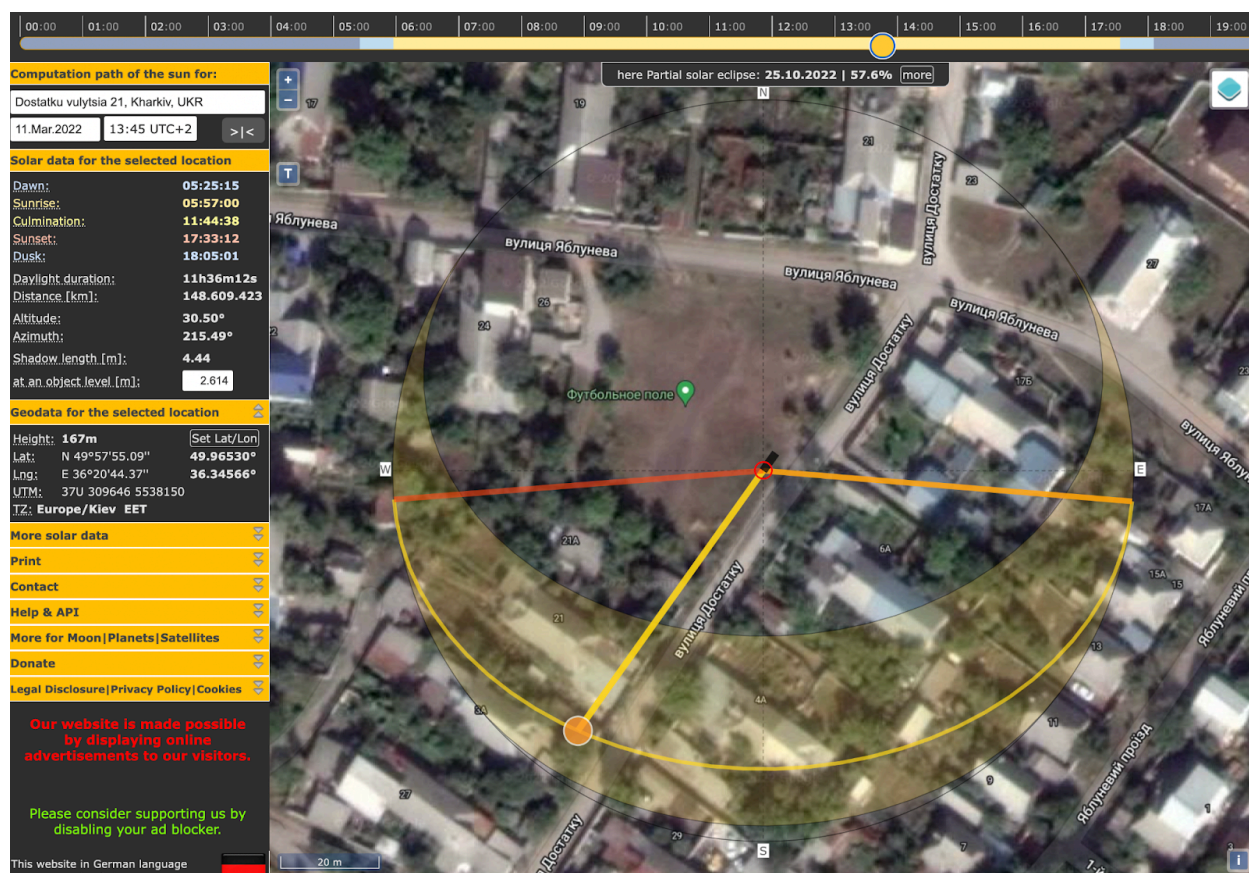
Identical basketball hoop was identified under the trade name “[Стойка для игры в стритбол с двумя щитами InterAtletika S728](https://play.interatletika.ua/ru/stoyka-dlya-igry-v-stritbol-s-dvumya-shchitami-interatletika-s728/)²⁰” (“Stand for street ball with two shields InterAtletika S728”) on the InterAtletika website, a large Ukrainian manufacturer of street sport equipment. According to the technical specifications provided on the InterAtletika website, the height of the basketball hoop pole from the ground to its top is 2614 mm (or 2.61 m), while its total height is 4188 mm (or 4.19 m).



The basketball hoop pole (Yellow Arrow) and the height of its lower hoop of 2.6m (Red Ellipse) as seen on S1V1 and the manufacturer's website.

With the known coordinates of the basketball hoop pole, its height and the length of its shadow, it is possible to estimate date and time based on the position of the Sun at the location of the Main Incident using SunCal.

²⁰ <https://play.interatletika.ua/ru/stoyka-dlya-igry-v-stritbol-s-dvumya-shchitami-interatletika-s728/>



Estimation²¹ of the Sun's position based on the length of the shadow cast by the basketball hoop pole at the location of the Main Incident using SunCalc.

II. Associated Incident

No information definitively establishing the date and time when the submunitions of the rocket impacted the location of the Associated Incident was identified in open sources.

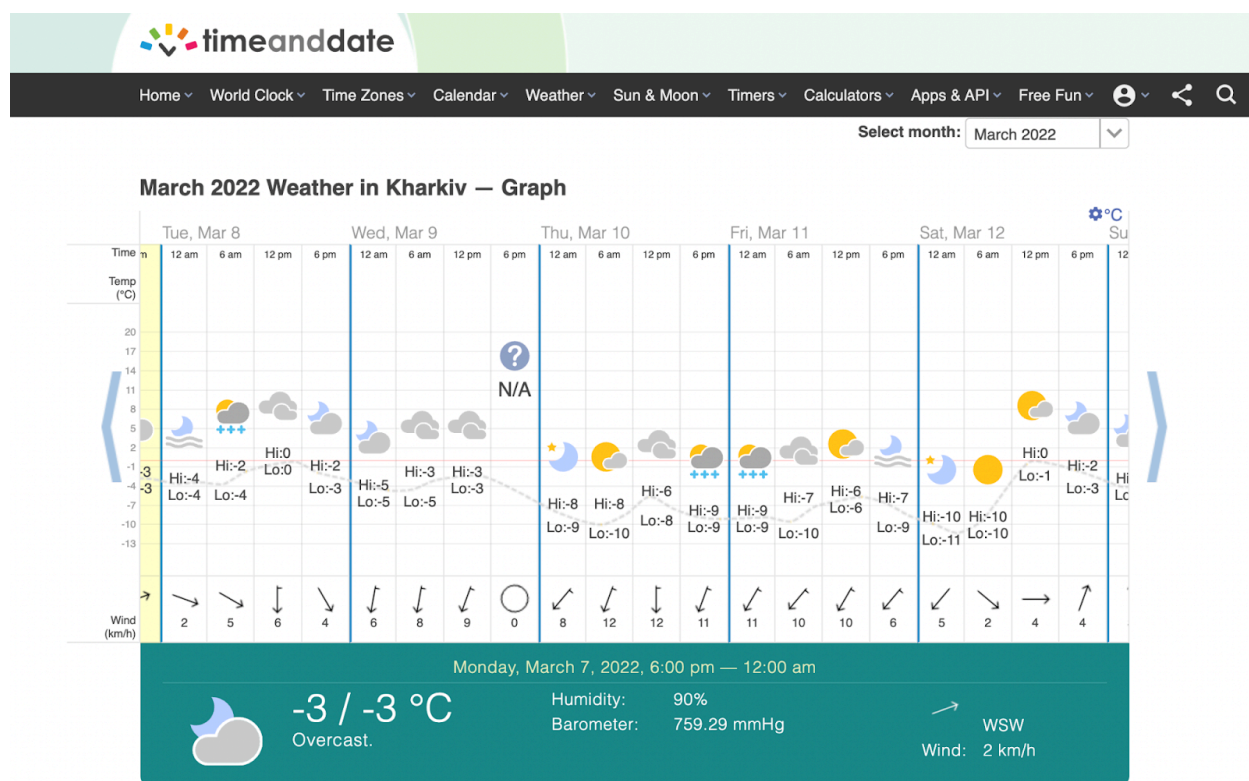
The scarce amount of material suitable for chronolocation makes it impossible to make estimations of the time and date of the Associated Incident. As such, it is only possible to state that the Associated Incident took place no later than 11/03/2022 at 13:27 EET when S2I2 and S2I3 were posted on Telegram.

However, no information was identified in open source suggesting that the damage depicted on S2I2 and S2I3 occurred in the context of any other event (i.e., car accident) or at some other date (month, year) either. The location of the Associated Incident within the area of estimated direction of origin of the cargo section (See the section 'Is there any evidence of the direction the munition came from?' below) and in close proximity (~900m) to the Main Incident further suggests a potential link between them. Finally, the sunny weather conditions and snow depicted on S2I2 and S2I3 are similar to the conditions depicted on S1I1 and S1V1, further suggesting that the Associated Incident and the Main Incident are possibly linked.

²¹ <https://www.suncalc.org/#/49.9653,36.3457,19/2022.03.11/13:45/2.614/1>

Weather Conditions

The weather [reported](#)²² in Kharkiv on 10-12/03/2022 was characterised by freezing temperatures and snow flurries lasting from approximately 18:00 EET on 10/03/2022, until approximately 12:00 EET on 11/03/2022. After 12:00 EET on 11/03/2022, the weather cleared with passing clouds until sunset at approximately 18:00 EET on 12/03/2022.



Weather conditions in Kharkiv between 09/03/2022 and 12/03/2022 (Credit: [timeanddate.com](https://www.timeanddate.com)²³)

This information corresponds to the weather conditions depicted on S1I1, S1V1, and S2I1. The visible thickness of the snow layer indicates that freezing temperatures were present in Kharkiv at the time when the photo was taken, suggesting winter or early spring as a likely season, while the undisturbed cover of fresh snow seen on S2I1 indicates that a snow flurry might have occurred recently and hence it was taken earlier than S1I1 and S1V1.

Based on the meteorological satellite imagery, it appears that the snow flurry might have occurred from late 10/03/2022 to early 11/03/2022, as large clouds are visible. In turn, lack of snow flurries on 11/03/2022 and 12/03/2022 is further suggested by the absence of clouds as seen on the meteorological satellite imagery taken above Kharkiv on 11/03/2022 and 12/03/2022.

²² <https://www.timeanddate.com/weather/ukraine/kharkiv/historic?month=3&year=2022>

²³ <https://www.timeanddate.com/>

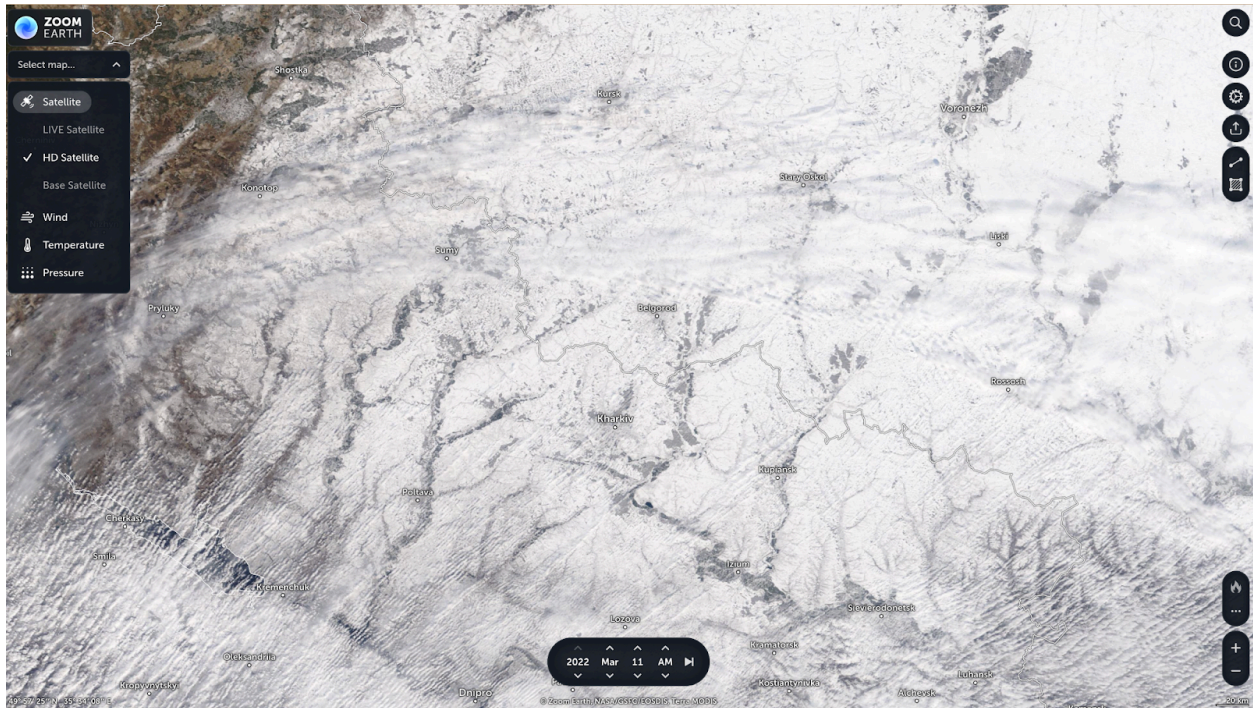


Clouds visible above Kharkiv before noon on 10/03/2022 (Credit: zoom.earth²⁴).

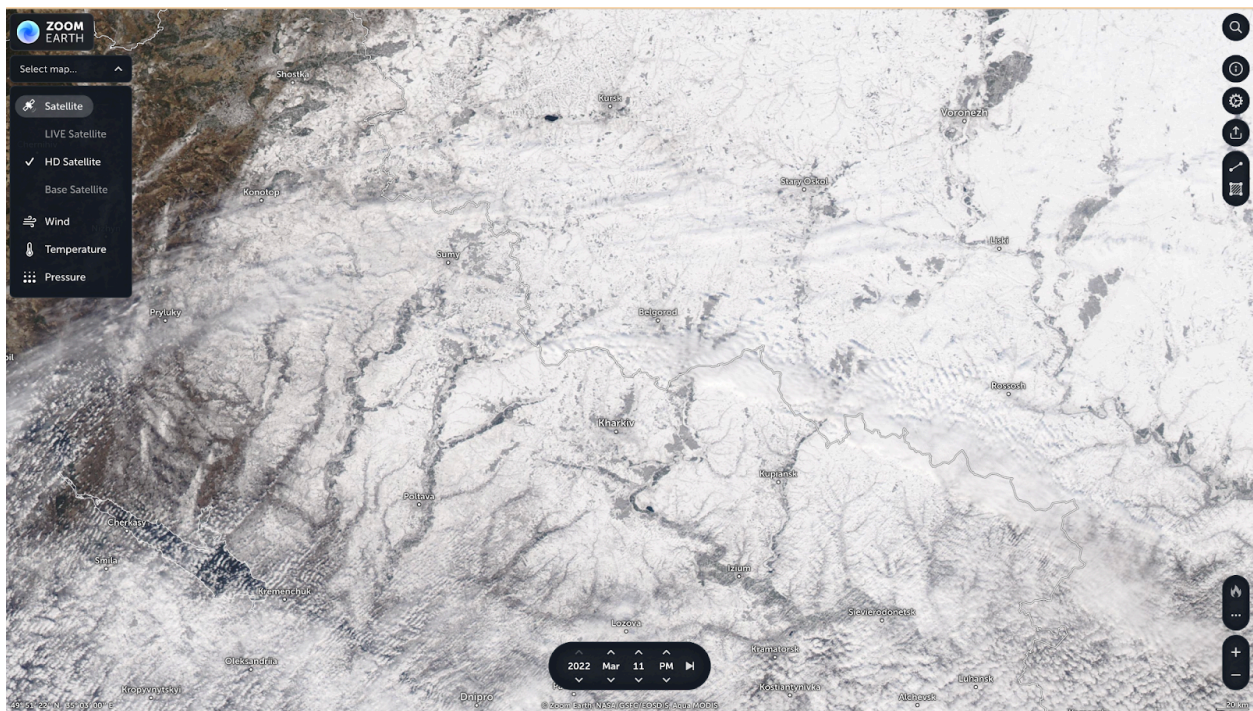


Clouds visible above Kharkiv after noon on 10/03/2022 (Credit: zoom.earth).

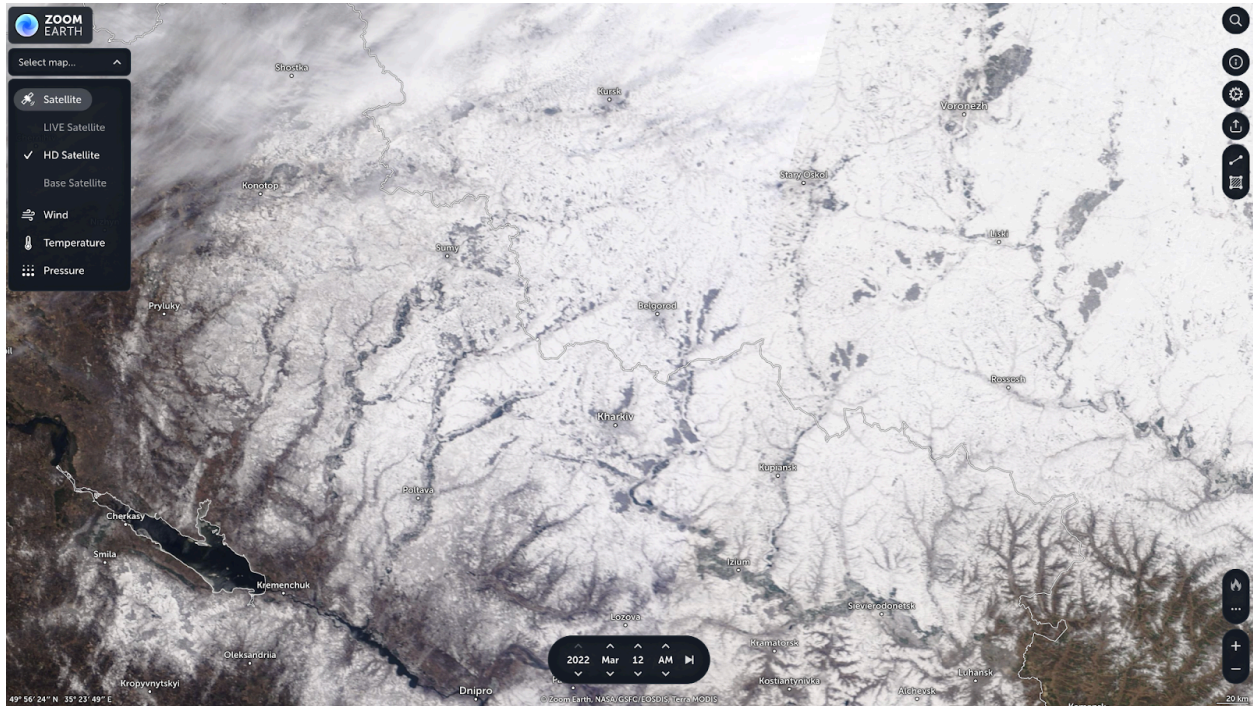
²⁴ <https://zoom.earth/>



Passing clouds above Kharkiv before noon on 11/03/2022 (Credit: zoom.earth).



Passing clouds above Kharkiv after noon on 11/03/2022 (Credit: zoom.earth).



Cloudless weather in Kharkiv before noon on 12/03/2022 (Credit: zoom.earth).



Cloudless weather in Kharkiv after noon on 12/03/2022 (Credit: zoom.earth).

Thus, although a small amount of snow is visible inside the crater of the cargo section's impact depicted on S2I1, neither the cargo section nor the crater are covered with snow, with pieces of brown soil clearly visible on both. This indicates that the location could have been impacted by

the cargo section at the end of the snowfall or shortly after the snowfall stopped, which, according to the weather forecast archive, happened on 11/03/2022 around 12:00 EET.

Furthermore, the sunny weather conditions and the absence of snowfall in the afternoon of 11/03/2022 and throughout 12/03/2022 may have resulted in a decrease of snow cover in the area. Multiple footprints in the snow visible on S1I1 and S1V1 in comparison to S2I1 may indicate that S1I1 and S1V1 were taken later than S2I1. As such, the Main Incident must have occurred no later than 11/03/2022 at 13:27 EET when S2I1 was posted.

Finally, S2V2 was posted together with S1I1, S2I2 and S2I3, which, as demonstrated above, are possibly linked to each other. Although not geolocated, S2V2 depicted weather conditions that match those depicted on all other visual materials in this assessment. Moreover, the recorded voice on S2V2 identified Saltivka [district] as the area of the black smoke. The voice additionally claimed that it was a result of a strike or shelling, which further indicates that the Main Incident and the Associated Incident could have occurred at the same time and location (Nemyshlyanskyi district of Kharkiv) and thus could be linked.

What Kind of Munition Was Used?

The object captured on S1I1, S1V1, and S2I1 was identified as the cargo section of a 9M55K cluster munition rocket. 9M55K is a surface-to-surface cluster munition rocket for the BM-30 Smerch MLRS which [reportedly](#)²⁵ carries a payload of explosive submunitions containing 96 of 4.5 g and 460 of 0.75 g of preformed metal fragments.

An identification of the rocket section as “the cargo section of a Smerch MLRS 9M55K cluster munition rocket” was made by Rob Lee, Senior Fellow in the Foreign Policy Research Institute’s Eurasia Program, on his Twitter [post](#)²⁶ at 12:10 EET on 13/03/2022. This information was further confirmed by comparison of the visual materials to the adopted reference imagery of parts of the Smerch 9M55K Rocket: the distinctive shape of the impacted cargo section and the position of vent holes match the reference imagery of the cargo section.

²⁵ <https://en.missilery.info/missile/smerch/9m55k>

²⁶ <https://twitter.com/RALee85/status/1502769070030131209>



Left: The cargo section depicted on S1I1. Right: The cargo section depicted on S2I1. Middle: [Reference imagery](#)²⁷ of the Smerch 9M55K cluster munition rocket.

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

Precise area/direction of origin

No information on the precise direction of origin, area or location of the launch site of the 9M55K rocket was identified at the time of the assessment.

Estimated directions and areas of origin

The range of a 9M55k rocket launched using the BM-30 Smerch MLRS is declared to be from 20 to 70 km, according to [ArmyRecognition](#)²⁸ and [missilery.info](#)²⁹.

The cargo section of a 9M55K rocket depicted on S1I1, S2I1, and S2V1 leans towards the North/NorthEastern direction. At the same time, the shape of the crater at the place of its impact with the ground and dirt marks visible and the cargo section facing the camera suggest that the cargo section may have possibly been launched from the South/SouthWestern direction (~35 degrees) and then overturned upon the impact due to its weight and accumulated velocity. As such, both hypotheses must be analysed for the purposes of establishing the likely direction of the cargo section's origin.

²⁷ <https://x.com/MarkHiznay/status/1496719886009126912/photo/1>
²⁸

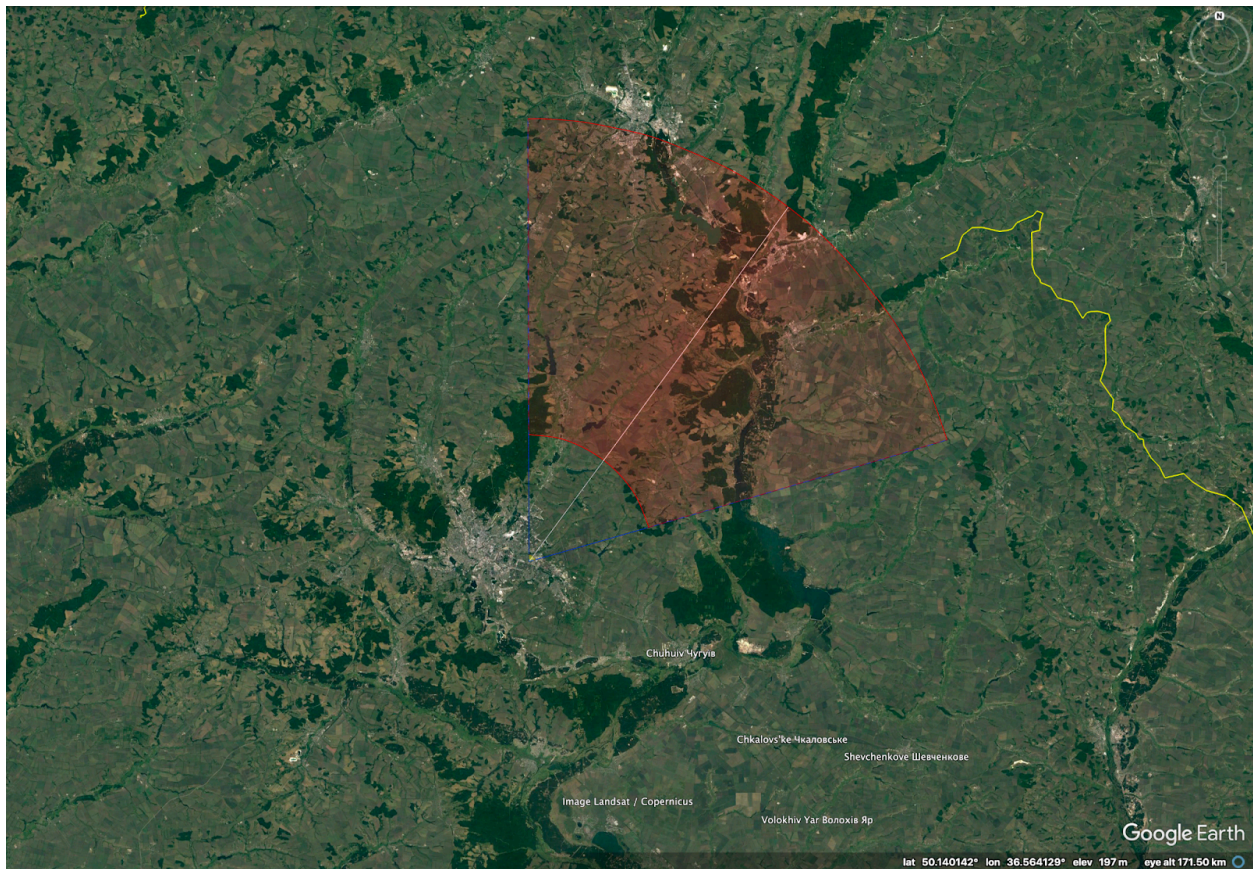
https://www.armyrecognition.com/russia_russian_army_vehicles_system_artillery_uk/bm-30_smerch_9k58_300mm_multiple_rocket_launcher_system_technical_data_sheet_information_description.html

²⁹ <https://missilery.info/missile/smerch/9m55k>

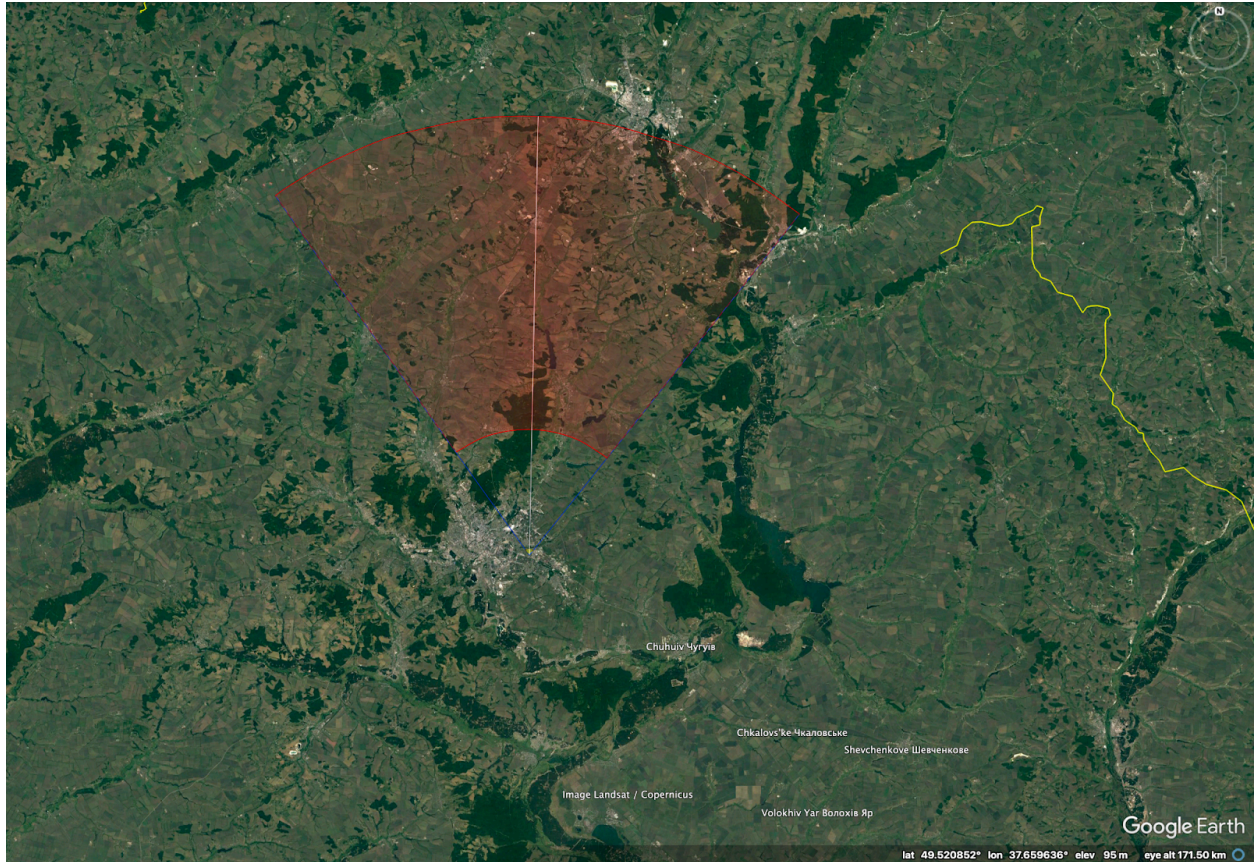
I. North/North-East

The 9M55K rocket could have been launched from the area of origin (red area) and direction (blue line) of origin are estimated based on:

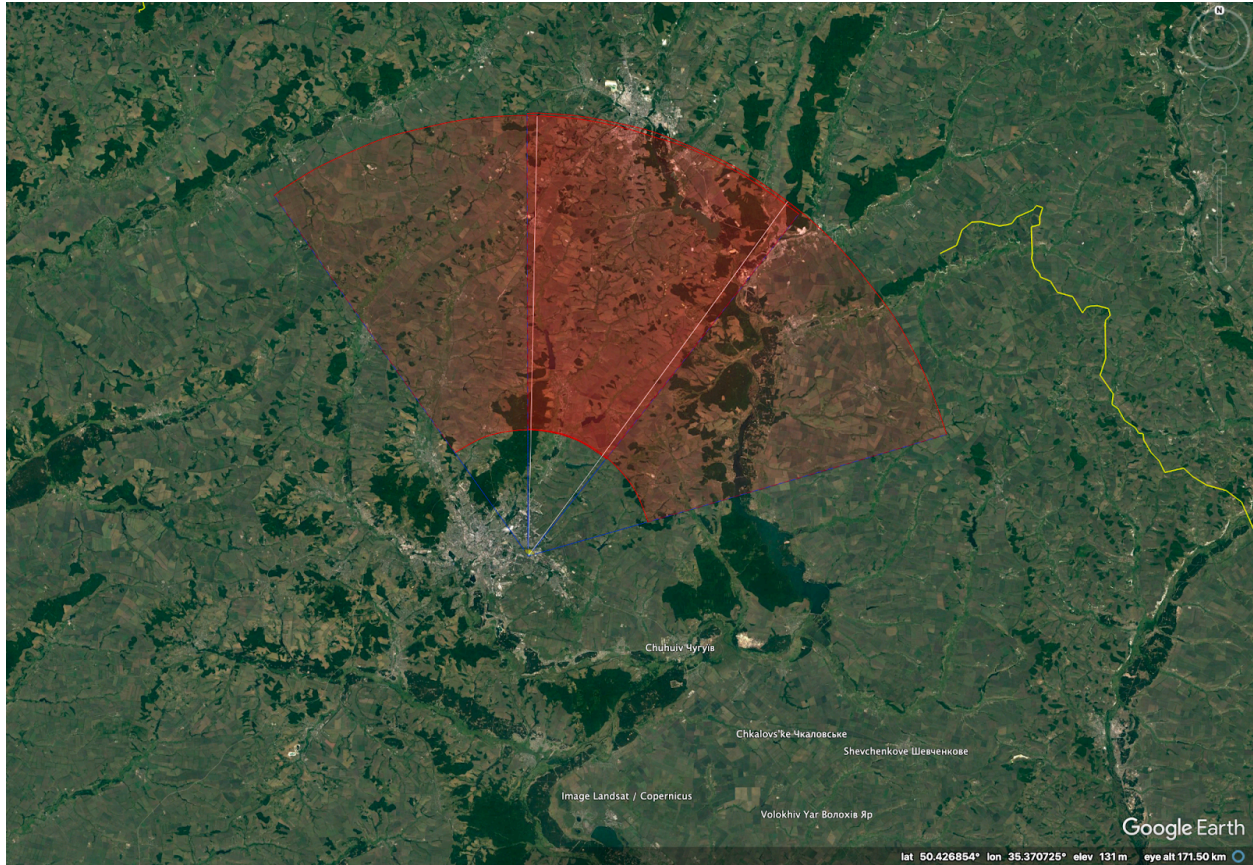
- 1) The direction of the cargo section at the location of the Main Incident (*Area of origin A*);
- 2) The direction of a straight line between the location of the Main Incident and the location of the Associated Incident (*Area of origin B*);
- 3) The overlay of Area A and Area B (*Area of origin C*).



Area of origin A (Credit: Google Earth Pro).

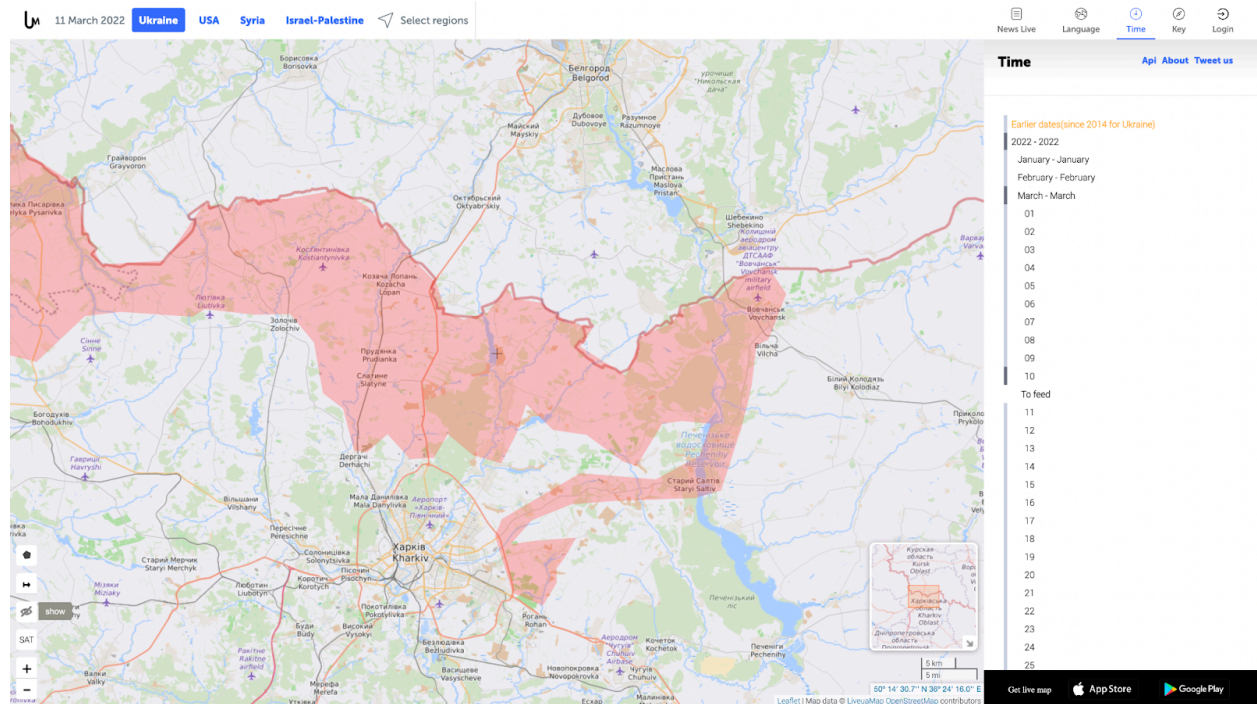


Area of origin B (Credit: Google Earth Pro).



Area of origin C (Credit: Google Earth Pro)

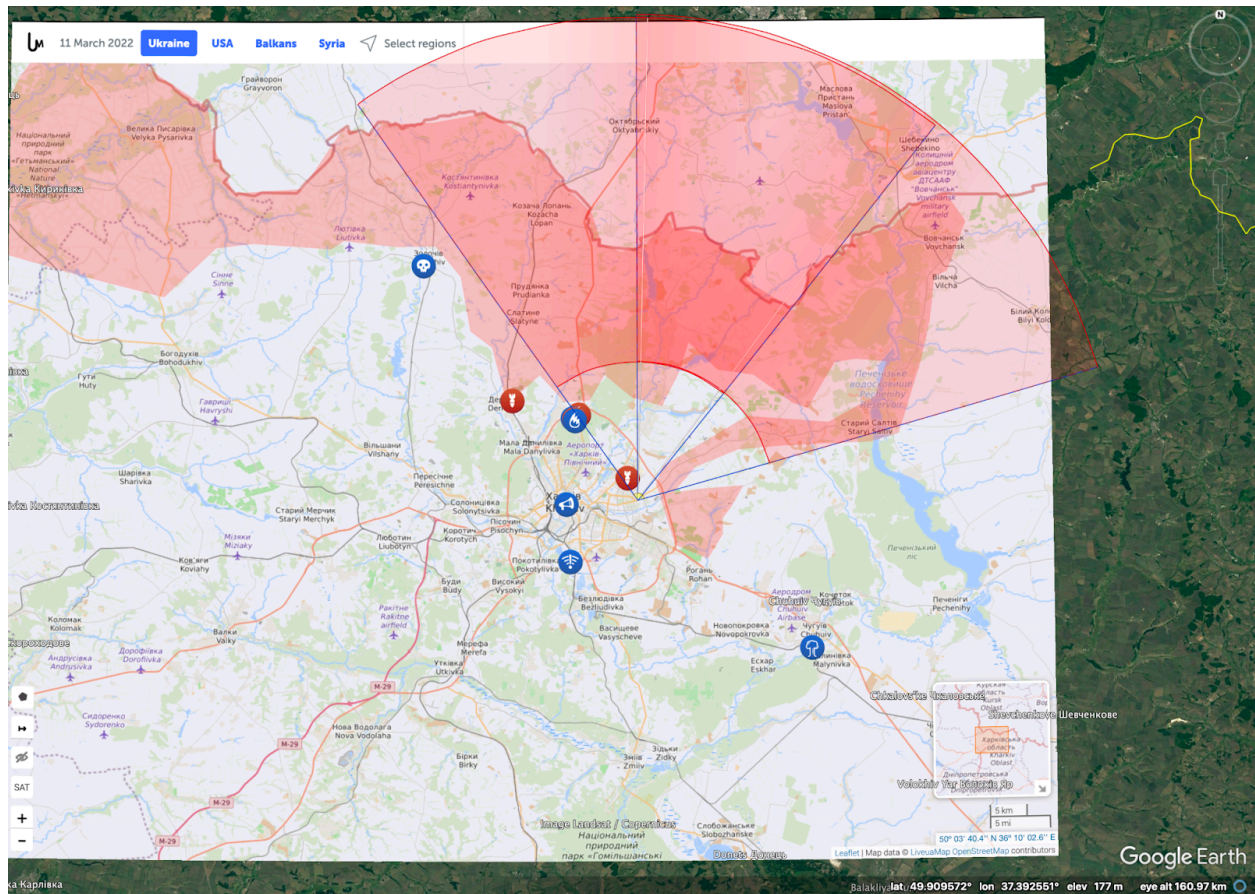
According to the reported open source information on conflict parties' troop movements on 11/03/2022, the Russian armed forces were present within the estimated area of origin both in the territory of Ukraine and Russia.



The presence of Russian armed forces reported on 11/03/2022 (Credit: [Liveuamap](https://liveuamap.com/en/time/10.03.2022)³⁰).

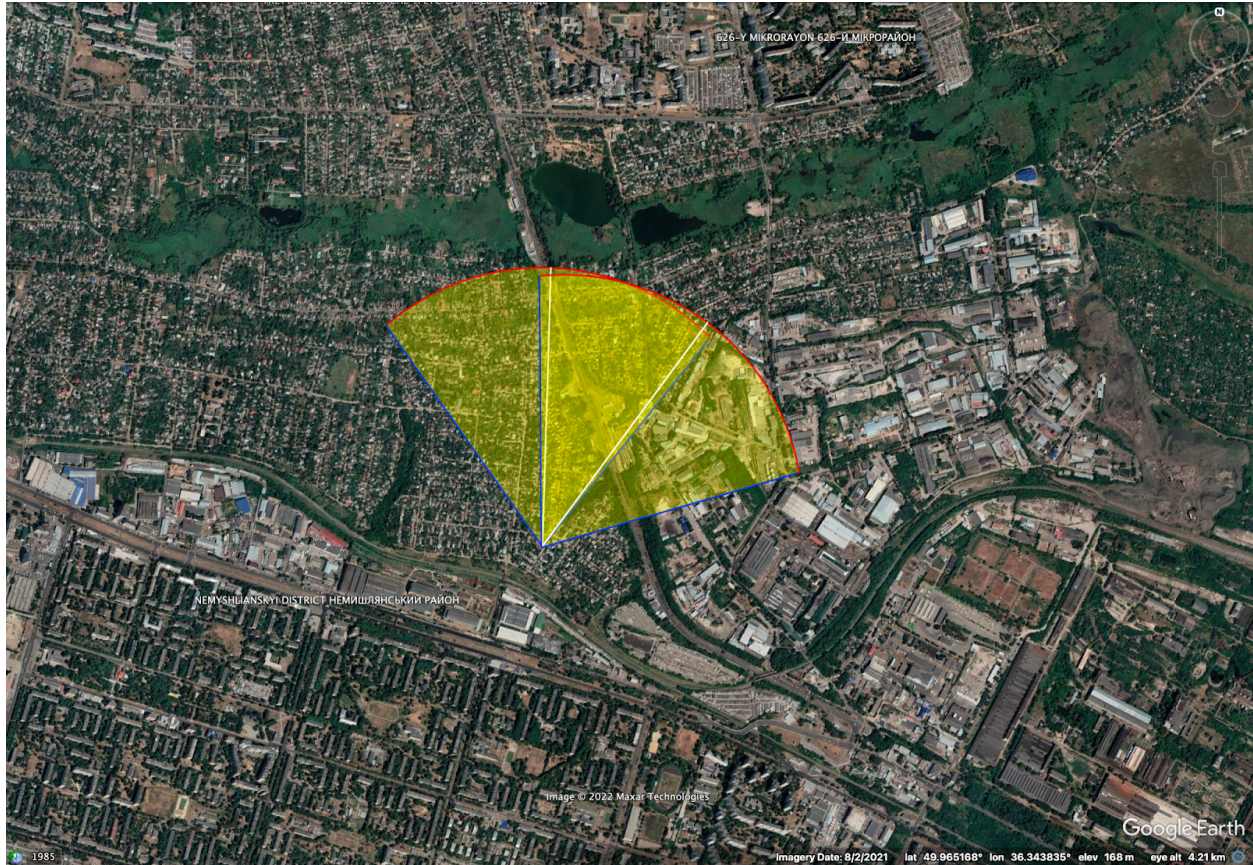
Area C is formed by the overlay of Area A and Area B and demonstrates that the majority of the Ukrainian territory within the estimated area of possible munition origin was reported to be under the control of Russian armed forces, as seen below.

³⁰ <https://liveuamap.com/en/time/10.03.2022>



Area of origin C formed by the overlay of Area of origin A and Area of origin B (Credit: [Liveuamap](https://liveuamap.com/en/time/10.03.2022)³¹, Google Earth Pro).

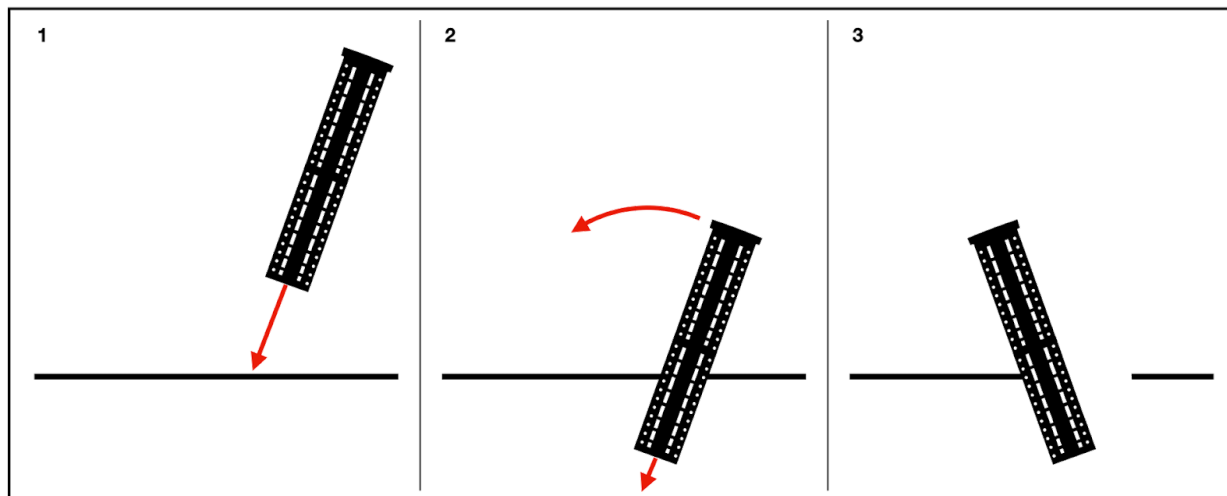
³¹ <https://liveuamap.com/en/time/10.03.2022>



Possible area of submunition impact within 1 km from the cargo section (Credit: Google Earth Pro).

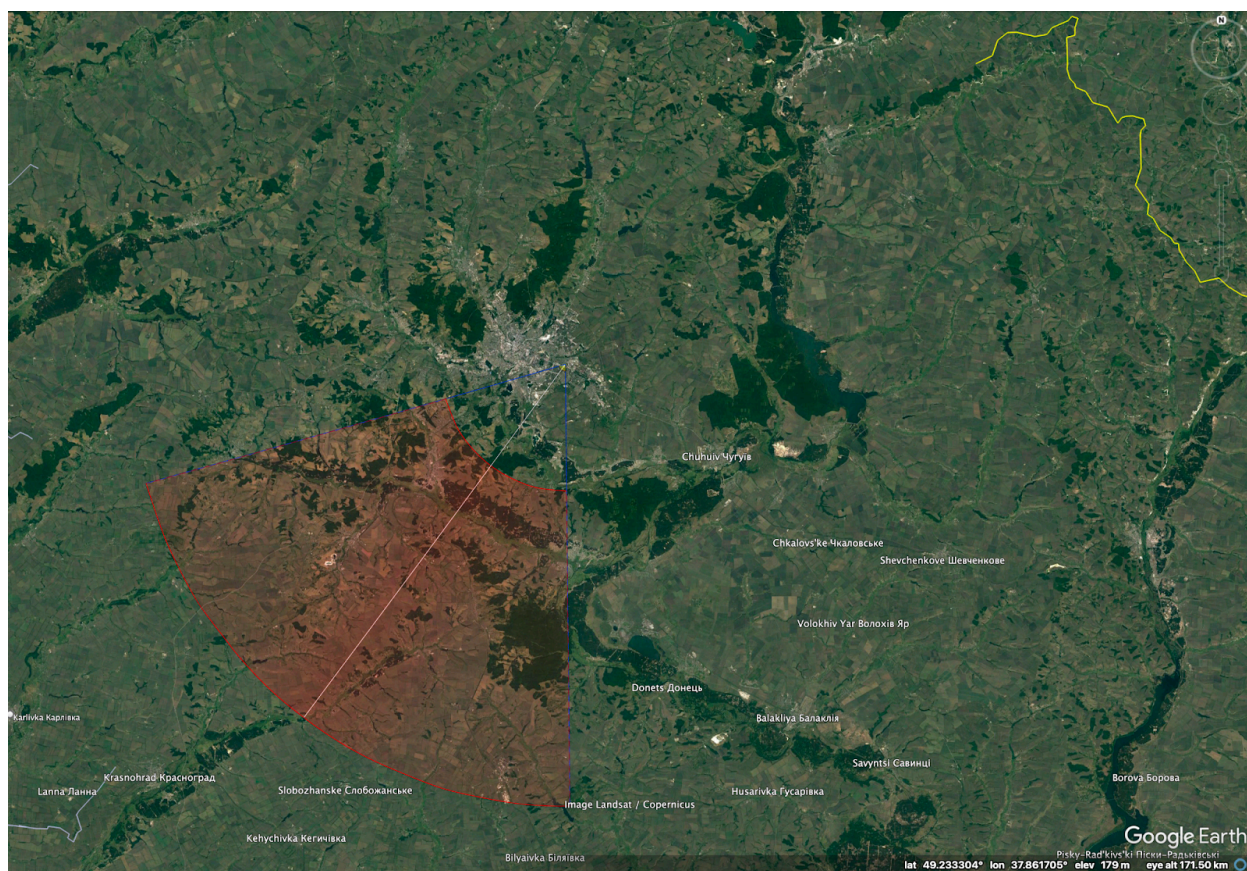
II. South/SouthWest

The 9M55K rocket could also have been launched from the area of origin (red area) located to the South/SouthWest direction from Kharkiv. While the cargo section is depicted pointing towards the North/NorthEastern direction, the shape of the cargo section's crater at the point of impact and particles of soil visible on its trunk indicate that the cargo section may have impacted the ground from the South/SouthWestern direction (*Area of origin D*) and then changed its position due to torsion. Absence of substantial deformation of the cargo section after the impact is likely due to the possible softness of the surface of the impacted football field relative to asphalt or concrete.

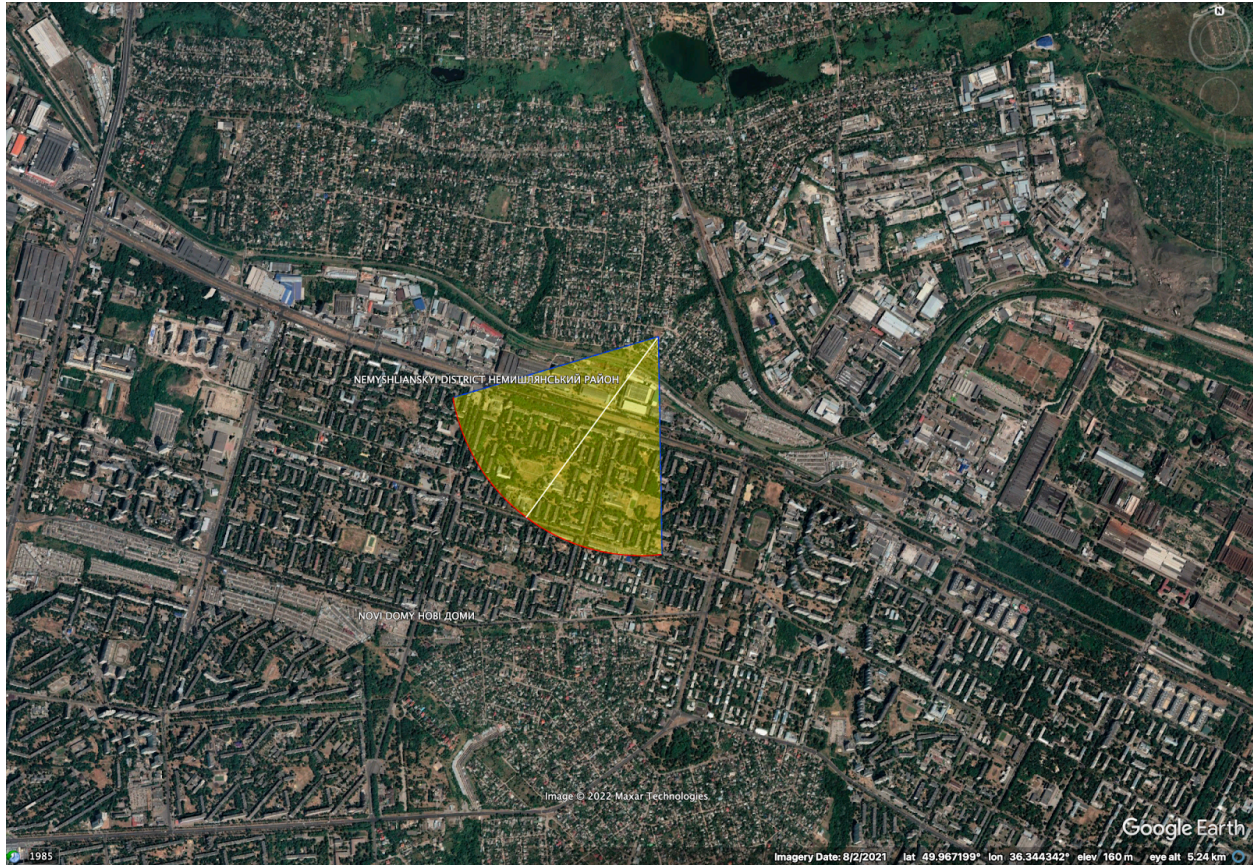


Possible trajectory of the cargo section after the impact

No information on the dislocation of Russian or Ukrainian armed forces or military formations in the Area of origin D, including those capable of launching an artillery strike using a 9M55K rocket was identified in open sources at the time of present assessment.



Area of origin D (Credit: Google Earth Pro).



Possible area of submunition impact within 1 km from the cargo section (Credit: Google Earth Pro).

Assumptions made in the present assessment regarding estimation of the direction of origin

- The general direction of the rocket's origin corresponds to the direction of the acute angle formed between the leaning part of the cargo section and the ground at the point of entry.
- The cargo section of the 9M55K rocket generally falls within ~1 km from the area damaged by its submunitions.
- Areas reported to be under control of either Ukrainian or Russian armed forces by sources mapped on the Liveuamap should be treated as an approximate estimation and corroborated with other evidence.

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

I. North/NorthEast

Within a 1 km arc from the Main Incident and the Associated Incident in the estimated direction of origin of the rocket, the structures are mainly residential buildings. The following industrial objects were also identified in this area, but were not reported to be used for military purposes at the time of the assessment:

A. Cluster of production and supply of industrial-grade chemicals:

1. 'Kharkivs'kyi Avtohenyy Zavod' (Acetylene Factory);
2. 'KHIMSNABZHENIYE';
3. 'HIMPROM';
4. 'KHARKOVREAKHIM';
5. 'NOVOKHIM';

B. 'EKSIMMASH' Industrial Equipment Factory;

C. 'Solodkyy Svit' Confectionery Factory;

D. Garage cooperative;

E. 'BVS' gas station.

II. South/South-West

Within a 1 km arc from the Main Incident in the estimated direction of origin of the 9M55K rocket from the South/SouthWest, the structures are mainly of civilian nature, namely residential buildings, shops, warehouses, and football fields.

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

No such information was identified at the time of the present assessment.

Statements from Parties of the Conflict

Ukraine

No statements of Ukrainian officials regarding the Main Incident and Associated Incident were identified.

20:00 EET 11/03/2022 [Mayor of Kharkiv](#): *"The situation in the city is very tense because shelling does not stop all the time. Residential areas of Kharkiv are being shelled. Now there is a lot of shooting in Horizont – it is a very large residential area; it is also Rohan, [and] the area of the KhTZ plant."* KhTZ stands for Kharkivs'kyi Trakhtorny Zavod ([49.9547, 36.3791](#)³²) and is located ~2.5km from the Main Incident and ~3.6km from the Associated Incident.

Russia

No statements of Russian officials regarding the Main Incident or the Associated Incident were identified.

³² <https://maps.app.goo.gl/DYF7HqRma6Yod2WB9>

Conclusion

Based on the information available in public sources at the time of the assessment, it was established that an object identified as the cargo section of a 9M55K cluster munition rocket impacted the football field in a residential area of the Nemyshlianskyi district in Kharkiv no later than at 13:27 EET on 11/03/2022.

Only objects of civilian nature could be identified in the vicinity of the impacted area. No presence of military infrastructure, objects or troops was reported or identified in public sources.

Despite the available open source information on Kharkiv being under artillery shelling and airstrikes at the time of the incident, no information definitively linking the cargo section to a precise area of impact of the submunitions could be identified in open sources. The exact launch site was not identified.

Two images of damaged civilian objects were published along with the image of the cargo section under the caption “The aftermath of shelling of Nemyshlyansky district, Saltivka, Kharkiv”. In the present assessment this is referred to as the Associated Incident, identified in the vicinity (~900m) of the Main Incident. The damage depicted was estimated to be within the possible range of a 9M55K submunition distribution by using the rocket recognition methodology adopted for this assessment. Information analysed indicates a possible link between the Main Incident and the Associated Incident.

Further Action

The use of a 9M55K cluster munition rocket is associated with a high risk of unexploded ordnance/submunitions (UXO) spread across the area of damage. UXO presents a persistent danger to a civilian population. Future damage and casualties caused by the explosion of an UXO within 1 km of the Main Incident and the Associated Incident should be monitored, verified, and linked to the present assessment, where relevant. Satellite imagery of the Main Incident and the Associated Incident, as well as potential launch sites within the estimated area of origin, should be requested.