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The Shayrat Connection: Was the Khan Shaykun Chemical Attack Inevitable but Preventable?

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Introduction

On April 4, 2017, at about 03.30 GMT, the town of Khan Shaykun in Idlib (northwestern Syria) was stormed by the Syrian Arab Air Force. Immediately after the attack, the victims – mostly civilians – started to show symptoms of exposure to neurotoxic chemical agents. Analyses of biomedical samples by various state and non-state actors suggested that sarin, a very rapidly acting, extremely lethal, and non-persistent nerve agent, was in fact used. Further radar trace assessments and review of the previously obtained signals intelligence inputs linked the chemical agent delivery to the Su-22 squadron from the Shayrat Airbase.¹

On April 19, 2017, the Organization for the Prohibition of Chemical Weapons (OPCW) shared laboratory results that indicated exposure to sarin and sarin-like substances.²

The incident marked yet another utilization of weapons of mass destruction (WMD) by the Baathist regime of Syria since the 2013 Ghouta attack. It also presented clear evidence of Syria's violation of the Chemical Weapons Convention. In fact, both experts closely monitoring Syria's chemical weapons program,³ and also some intelligence agencies,^{4 5} have previously warned the international community about the regime's retention of chemical warfare capabilities.

However, the Khan Shaykun attack differed from the previous chemical weapons (CW) uses by the regime in regards to its consequences. This time, the US administration ordered a punitive and surgical strike delivered by 59 Tomahawk Block IV cruise missiles launched from two Arleigh Burke-class destroyers in the Mediterranean in the early morning of April 7, 2017.⁶

The Tomahawk salvo targeted Shayrat Airbase, which is important for broader strategic reasons. Satellite imagery previously revealed that the Russians had deployed attack helicopters in al-Shayrat.⁷ Although no Russian assets were harmed by the US strike, due to in advance notification, the operation was also a political – military gesture.

This report aims to assess the Syrian Baathist regime's 'geopolitical algorithm' for using chemical weapons, Assad's forces' military-geostrategic approach to the conflict, and the Syrian Arab Armed Forces' doctrinal understanding of weapons of mass destruction in the course of the civil war. The preferred title for the study is 'The Shayrat Connection' for a clear reason. It is thought that Hafez al-Assad's legacy of quelling the 1982 Hama uprising, doctrinal approaches of the Syrian chemical weapons command structure, praetorian cliques within the Syrian Arab Armed Forces, and further trajectory of the civil war all revolve around this Shayrat connection.

¹ For the full text of the US intel, see: <https://fas.org/irp/news/2017/04/wh-assad.pdf>, Accessed on: May 9, 2017.

² OPCW, <https://www.opcw.org/news/article/opcw-director-general-shares-incontrovertible-laboratory-results-concluding-exposure-to-sarin/>, Accessed on: May 9, 2017.

³ Dany, Shoham. "Has Syria's Chemical Weapons Arsenal Truly been Dismantled", BESA Perspective Papers No 252, 2014.

⁴ Haaretz, <http://www.haaretz.com/opinion/.premium-1.668230>, Accessed on: May 9, 2017.

⁵ BBC, <http://www.bbc.com/news/world-middle-east-39796763>, Accessed on: May 9, 2017.

⁶ The US Department of Defense, <https://www.defense.gov/News/Article/Article/1144601/trump-orders-missile-attack-in-retaliation-for-syrian-chemical-strikes/>, Accessed on: May 9, 2017.

⁷ IHS Jane's, <http://www.janes.com/article/60102/russia-sets-up-palmyra-base>, Accessed on: May 9, 2017.

Brief Technical Assessment of the Khan Shaykun Attack

Even prior to the OPCW findings, three important pieces of evidence already suggested nerve agent use, which made the Khan Shaykun attack a very different case compared to the regime's chlorine barrel bombings that notoriously became 'business as usual'.

First of all, some of the initial findings about the weaponized chemical agent were explained by the Turkish Ministry of Health, as many of the victims were brought to hospitals in Hatay. The laboratory results from the biomedical samples showed intensive exposure to isopropyl methylphosphonic acid.⁸ Methylphosphonic acid metabolites are important references for sarin investigations, as this same method was used when investigating the Tokyo subway attack in 1995, in order to detect any potential sarin exposure.⁹

Secondly, independent non-governmental organizations, activist groups, and doctors from the ground reported typical symptoms of nerve agents exposure. Médecins Sans Frontières, for example, reported muscle spasms, involuntary defecation, and constricted pupils in the victims treated at Bab al Hawa Hospital.¹⁰

Additionally, the World Health Organization mentioned that atropine was one of the emergency medicines rushed to the hospitals that were treating the victims of the Khan Shaykun attack.¹¹ Atropine is typically used to treat exposure to some nerve agents, notably sarin.¹²

Two weeks after the chemical attack, on April 19, 2017, the OPCW officially concluded that analyzed bio-medical samples collected from various autopsies indicated that the victims were in fact exposed to sarin and sarin-like substances. The OPCW report underlined that these results were incontrovertible.¹³

Furthermore, several intelligence findings strongly suggested that the regime used sarin nerve agent in Idlib. Consequentially, the French Intelligence's National Evaluation is one of the most detailed and technical assessments available to this point. The report indicates that "*... environmental samples collected at one of the impact points of the chemical attack at Khan Sheikhoun on 4 April 2017 reveal the presence of sarin, of a specific secondary product (diisopropyl methylphosphonate – DIMP) formed during synthesis of sarin from isopropanol and DF (methylphosphonyl difluoride), and hexamine. Analysis of biomedical samples also shows that a victim of the Khan Sheikhoun attack, a sample of whose blood was taken in Syria on the very day of the attack, was exposed to sarin. ...According to the intelligence obtained by the French services, the process of synthesizing sarin, developed by the Scientific Studies and*

⁸ Al Jazeera Turk, <http://www.aljazeera.com.tr/haber/akdag-idlibde-sarin-gazi-kullanildigi-kesinlesmistir>, Accessed on: May 8, 2017.

⁹ The US National Center for Biotechnology Information – National Library of Medicine, <https://www.ncbi.nlm.nih.gov/pubmed/9300859>, Accessed on: May 8, 2017.

¹⁰ MSF, <http://www.msf.org/en/article/syria-khan-sheikhoun-victims-have-symptoms-consistent-exposure-chemical-substances>, Accessed on: May 8, 2017.

¹¹ World Health Organization, <http://www.who.int/mediacentre/news/statements/2017/toxic-chemicals-syria/en/>, Accessed on: May 8, 2017.

¹² CDC, https://www.cdc.gov/niosh/ershdb/emergencyresponsecard_29750001.html, Accessed on: May 8, 2017.

¹³ For the full release, see: OPCW, <https://www.opcw.org/news/article/opcw-director-general-shares-incontrovertible-laboratory-results-concluding-exposure-to-sarin/>, Accessed on: May 8, 2017.

*Research Centre (SSRC) and employed by the Syrian armed forces and security services, involves the use of hexamine as a stabilizer. DIMP is also known as a by-product generated by this process”.*¹⁴

The United Kingdom was another Western actor that openly voiced the technical findings in Syria. The UK Permanent Representative to the OPCW, Ambassador Geoffrey Adams, stated that British scientists analyzed the samples obtained from Khan Shaykun, and that the samples tested positive for sarin and sarin-like substances.¹⁵

The US intelligence community did not only engage in biomedical sample analysis, yet also discovered communications between the Syrian military sources and chemical warfare experts just before the attack.¹⁶

Notably, the French intelligence’s key finding of hexamine in the evidence was critical. Hexamine is the ‘signature’ substance used by the Syrian Scientific Studies and Research Centre (SSRC or CERS), and is consequently used in the sarin synthesis. More importantly, this critical finding completes the missing dots between the 2013 Saraqeb and 2017 Khan Shaykun attacks.¹⁷

At this point, one might ask the following technical question about the Idlib attack: Why did Assad’s chemical warfare planners’ choose to use sarin? Indeed, most of the Syrian Arab Armed Forces’ post – 2013 chemical attacks were based on chlorine, which is a choking agent. In many cases, barrel bombs dropped from rotary – wing assets were preferred for the delivery. These at first primitive yet currently developing weapons have become one of the most important outcomes of the systematic killing of civilians and mass displacement in Syria.¹⁸

Sarin and sarin – like neurotoxins were the ‘chemical agent of choice’ not nearly as frequently. However, these fewer cases were the most critical ones, either due to the regime’s geopolitical core, Damascus, such as in the 2013 Ghouta attack;¹⁹ or in order to attack key lines of communication such as in the 2013 Saraqeb CW strike.²⁰ Underlying strategic reasons for sarin use, which stem from the Baathist regime’s geopolitical understanding of the conflict, are analyzed in the subsequent parts of this report. Nevertheless, this study concludes that there are technical reasons behind the sarin attacks as well.

¹⁴ For the full text of the French Intelligence’s National Evaluation, see: http://www.diplomatie.gouv.fr/IMG/pdf/170425_-_evaluation_nationale_-_anglais_-_final_1_cle8ca411.pdf, Accessed on: May 8, 2017.

¹⁵ For the full statement by the British Ambassador to the OPCW, see: <https://www.gov.uk/government/speeches/54th-special-session-of-the-executive-council>, Accessed on: May 8, 2017.

¹⁶ CNN, <http://edition.cnn.com/2017/04/12/politics/us-intelligence-syrian-chemical-weapons/>, Accessed on: May 9, 2017.

¹⁷ http://mapage.diplomatie.gouv.fr/IMG/pdf/170425_-_national_evaluation_annex_-_anglais_-_final_1_cle8211fe.pdf, Accessed on: May 8, 2017.

¹⁸ For the Human Rights Watch assessment on chlorine – filled barrel bombs, see: https://www.hrw.org/sites/default/files/related_material/syria_8.pdf, Accessed on: May 8, 2017; for the Mayday Rescue testimony, see: <http://docs.house.gov/meetings/FA/FA00/20150617/103638/HHRG-114-FA00-Wstate-HabibF-20150617.pdf>, Accessed on: May 8, 2017.

¹⁹ For the Human Rights Watch report about the sarin use in Ghouta in 2013, see: https://www.hrw.org/sites/default/files/reports/syria_cw0913_web_1.pdf, Accessed on: May 8, 2017.

²⁰ For detailed info presented by French Intelligence sources, see: http://mapage.diplomatie.gouv.fr/IMG/pdf/170425_-_national_evaluation_annex_-_anglais_-_final_1_cle8211fe.pdf, Accessed on: May 8, 2017

The Chemical Blitz

To fully grasp the sarin attacks in Syria, one should begin with developing a thorough understanding of chemical warfare itself. A belligerent can use CW, especially during times of conventional shortcomings, to accomplish one of the following objectives: to exert a tactical anti-access / area denial (A2/AD) zone for the adversary to halt or slow down its advance, to impose a significant attrition factor on enemy combat power through employing incapacitating agents, to massively destroy the enemy by using lethal agents at necessary doses, to neutralize a target without physical destruction, or in order to depopulate an area by using CW on a civilian population. Particularly in the latter, aggressors utilize both kinetic and psychological effects of chemical warfare.

One of the most important aspects of offensive chemical warfare is to decide whether to use persistent or non-persistent agents. Non-persistent agents, such as hydrogen cyanide or sarin, would bring about higher casualties with the added surprise factor against unprotected targets. On the other hand, persistent agents, such as VX or sulfur mustard, can slow down enemy advance for a longer time and deny territorial control. However, these persistent agents are necessarily unreasonable if the offensive side plans to immediately engage in conventional incursions into the very same area, due to lingering effects from previous contamination.²¹

Volatility is a key parameter in a chemical agent's persistence. For instance, 1 m³ of air can hold approximately 22,000 mg Sarin at 25°C, while sulfur mustard would feature only 900mg, and VX would have only 10mg.²² Categorically, an offensive chemical warfare planner is expected to use more non-persistent nerve, blood, and choking agents in anti-personnel missions, whereas they would prefer persistent nerve and blister agents if the focus was placed on denying terrain, targeting enemy logistical lines and command & control centers, or reducing the adversary's operational tempo.²³

Sarin (GB) is a nerve agent with low persistency and a very rapid rate of action.²⁴ In other words, unlike VX, which is quite persistent, Sarin is not an ideal A2/AD agent. Furthermore, due to its utmost maximum lethal effects and very rapid rate of action, it is typically not the agent of choice during incapacitating missions. Clearly, one would use sarin to deliver a 'chemical blitz' to rapidly clear enemy formations at critical times, and to terrorize indigenous populations, forcing them to move. These two motives were more or less the regime's calculations in its sarin uses. Chlorine is also a non-persistent agent, which has been frequently weaponized through barrel bombs, and dropped by Assad's forces' helicopters in assault operations against rebel formations. Yet, as a choking agent, chlorine's lethal capabilities are much less than sarin, and its rate of action is not as rapid. Thus, it cannot deliver the same chemical blitz result.

The Syrian regime is believed to have acquired some CW capabilities in the 1970s by transferring sarin nerve agent and mustard blister agents from Egypt. By the 1980s, the Syrian WMD know-how was adequate enough to produce unitary warheads for sarin delivery. As the regime progressed in CW related technologies, it was able to produce

²¹ Ernest T. Takafuji, and Allart B. Kok, *The Chemical Warfare Threat and the Military Healthcare Provider*, in *Medical Aspects of Chemical and Biological Warfare*, 1997, pp.122-124.

²² *Ibid.*

²³ The US Chairman of the Joint Chiefs of Staff, JP 3-11, p.A-2, 2013.

²⁴ The US Air Force Center for Unconventional Weapons Studies, *Chemical and Biological Warfare Overview*, p. 8.

binary warheads and modify cluster bombs by the 1990s. And finally, by the late 1990s and the early 2000s, Damascus was arming its Scud variants ballistic missile inventory with chemical warheads for VX delivery.²⁵ Clearly, Assad's forces have a significant level of experience in offensive chemical operations.

In sum, it is seen that the regime has preferred chlorine filled barrel bomb strikes as a consistent way of reinforcing its operations in risky areas and in outnumbered situations. On the other hand, Assad's chemical warfare experts most probably see sarin as a powerful punch that is tailor-made for pressing military situations in geopolitically valuable territories. On a separate note, this report anticipates that in case the regime is forced to use its CW arsenal in an interstate conflict with a drastically unfavorable military balance, the agent of choice would most probably be VX.

The Regime's Top Chain of Command: Managing the Chemical Warfare Capabilities

Tracing back the sanctions imposed by the United States and the European Union reveals the key figures of the Baathist regime's WMD programs. In light of open-source reviews, this paper assesses that the Baathist regime's WMD arsenal, especially the chemical weapons that were kept hidden from the eyes of the OPCW mission, has been managed by a small elite found in the Air Force, the Air Force Intelligence, the Military Intelligence, the Republican Guard, and the Political Security Directorate. Notably, top military commanders of the Syrian war machine, such as Major General Ahmad Ballul (*Commander of the Air Force and the Air Defense Forces*), Major General Muhammad Mahmud Mahalla (*Chief of the Military Intelligence*), and Major General Talal Shafiq Makhluaf (*Commander of the Republican Guard*), are directly involved in the chemical chain of command along with Muhammad Khalid Rahmun, the Political Security Directorate chief.²⁶ Furthermore, according to the Israeli defense and security community, one of the closest monitors of Syria's armageddon arsenal, the use of chemical weapons in Idlib was approved by the regime's top leadership.²⁷

In fact, a strictly centralized decision-making architecture for the CW arsenal should not be surprising for those who are familiar with the Syrian strategic culture. Many contemporary military concepts of the Syrian Arab Armed Forces are inherited from Soviet legacy. During the Cold War, the US intelligence community's assessments of the Soviet chemical warfare program suggested a centralized command structure. While the Central Intelligence Agency and the Defense Intelligence Agency had their disagreements about whether Moscow saw its CW arsenal as a part of non-nuclear or nuclear phase of the conflict, both agencies agreed that the Soviet Supreme High Command exerted the ultimate decision-making authority.²⁸ Thus, imagining today that Syrian operational commanders might preside over CW decisions would be naïve. Yet, as this report details subsequently, few privileged operational commanders from the

²⁵ Anthony, H. Cordesman, *Syrian Weapons of Mass Destruction*, CSIS, 2008.

²⁶ The US Department of the Treasury, "Treasury Sanctions Syrian Officials In Connection With OPCW-UN Findings Of Regime's Use Of Chemical Weapons On Civilians", <https://www.treasury.gov/press-center/press-releases/Pages/jl0701.aspx>, Accessed on: April 25, 2017.

²⁷ Haaretz, <http://www.haaretz.com/middle-east-news/syria/1.781564>, Accessed on: April 26, 2017.

²⁸ CIA Historical Review Program Release, *The Soviet Offensive Chemical Warfare Threat to NATO*, 1984.

Syrian Arab Armed Forces' very own elite combat formations may enjoy some influence on the CW use through their assessments of unfolding battlefield situations.

Apart from the top chain of command, the military-science base of the Syrian WMD programs is of critical importance for logistical and know-how reasons.

Widely-known with its French acronym, CERS (*Centre d'Etudes et de Recherches Scientifiques – SSRC in English acronym*), serves as the regime's scientific center for developing strategic military capabilities. CERS' organizational structure includes general sections (i.e. Section-4 for missile proliferation) and specific project directorates (i.e. Project 99 for Scud missiles), as well as several sub-institutes for running chemical and biological warfare programs.²⁹ At the time of writing, the US Department of the Treasury sanctioned 271 individuals from the CERS due to their links to chemical atrocities in Syria, particularly in the April 4 Khan Shaykun attack.³⁰ As declared by the US Department of the Treasury: *“these 271 SSRC employees have expertise in chemistry and related disciplines and/or have worked in support of SSRC's chemical weapons program since at least 2012”*.³¹

Bashar al-Assad's critical link to the CERS is believed to be facilitated through General Bassam al-Hassan.³² In the United Kingdom's sanctions list, General al-Hassan is designated as “Presidential Advisor for Strategic Affairs”.³³ The US Department of the Treasury designated General al-Hassan as the Syrian President's representative to the CERS and reported that the general was involved in procurements for the regime.³⁴

Open-source intelligence reports suggest that within the CERS, a loyal and special unit, Unit 450, which was established on a sectarian and political basis, is responsible for chemical ammunitions production.³⁵ It is suspected that General Ghassan Abbas directs Unit 450.³⁶ EU sanctions openly state the general's core role in the CERS and links him to the 2013 Ghouta chemical attacks.³⁷

Military Geostrategic Context of the CW Use in Syria

Cold War assessments of the Syrian offensive chemical weapons program suggests that Israel's conventional superiority over the Syrian forces, and especially fears stemming from the possibility of the fall of Damascus during the 1973 Arab – Israeli War, encouraged the regime to augment its indigenous CW capabilities. A top secret US

²⁹ IHS Jane's, SSCR: Spectre at the Table, 2014.

³⁰ Reuters, <http://www.reuters.com/article/us-mideast-crisis-syria-sanctions-idUSKBN17Q1VB>, Accessed on: April 25, 2017.

³¹ The US Department of the Treasury, <https://www.treasury.gov/press-center/press-releases/Pages/sm0056.aspx>, Accessed on: April 25, 2017.

³² Gregory, Koblentz. “Syrian Chemical Weapons Kill Chain”, Foreign Policy, April 7, 2017.

³³ For the full list, see: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/601796/syria.pdf, Accessed on: April 26, 2017.

³⁴ The US Department of the Treasury, <https://www.treasury.gov/press-center/press-releases/Pages/jl2391.aspx>, Accessed on: April 26, 2017.

³⁵ For the French Defense Ministry source, see: http://www.defense.gouv.fr/content/download/219128/2437985/file/National_executive_summary_of_declassified_intelligence.pdf, Accessed on: April 26, 2017.

³⁶ Gregory, Koblentz. “Syrian Chemical Weapons Kill Chain”, Foreign Policy, April 7, 2017.

³⁷ For detailed info, see: <http://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A32015R0375>, Accessed on: April 26, 2017.

Central Intelligence Agency (CIA) report prepared in 1985 – declassified in 2011 – concluded the following key analyses on the issue.³⁸

- ✓ Syria took advantage of defensive chemical training given by the Soviets in the 1960s to launch an offensive CW program in the 1970s.
- ✓ President Hafez al-Assad had full control over the CW arsenal and its means of delivery.
- ✓ A small group of scientists in the CERS and some military personnel with defensive chemical warfare training were involved in CW activities.
- ✓ Within the CERS, the CW program was hidden in agricultural and medical researches.
- ✓ The regime's choice of delivery was surface-to-surface ballistic missiles, especially Scuds.
- ✓ The regime preferred binary chemical agents not only for storage security but also for ensuring better political control over the WMD arsenal.

To truly understand the contemporary Syrian chemical chain of command, one would need two essential analytical inputs: the determining characteristics of the regime, and the doctrinal structure of the Baathist military machine.

Intelligence assessments analyzing the Syrian WMD doctrine estimated that the regime has considered these capabilities as last resort measures³⁹, and a way to counterbalance both Israel's and Turkey's conventional superiorities over the Syrian Arab Armed Forces. A supporting component of ensuring strategic parity has been Damascus' proxy campaigns through terrorist organizations.⁴⁰ Furthermore, although there is no known open-source WMD white paper prepared by the regime, information obtained from some defected generals, who were involved in the strategic weapons programs, suggested that Damascus saw the utility of chemical weapons as a 'last resort', such as preventing the complete fall of a major city like Aleppo.⁴¹ Yet, at the time of writing, another defector from Syria's CW command ranks, Brigadier General Zaher al-Sakat, claimed that despite the fact that the regime declared 1,300 tons of chemical warfare agents and precursors, that the actual 2013 inventory was closer to 2,000 tons.⁴² Thus, it points out that the 'last resort' must still be on the table for Assad's forces.

So, should the regime's tactical CW use surprise military analysts? To answer this question, one would first need to respond to a more ontological, yet illuminating question: from a conceptual standpoint, what is the 'last resort' threshold for the Baathist elite?

³⁸ The Central Intelligence Agency, <https://www.cia.gov/library/readingroom/docs/CIA-RDP87T00289R000100220001-4.pdf>, Accessed on: April 26, 2017.

³⁹ The Central Intelligence Agency, <https://www.cia.gov/library/readingroom/docs/CIA-RDP87T00289R000100220001-4.pdf>, Accessed on: April 26, 2017.

⁴⁰ Shmuel, Bar. "Bashar's Syria: The Regime and Its Strategic Worldview, Comparative Strategy, No: 25, pp.353-445. 2006.

⁴¹ Haaretz, <http://www.haaretz.com/middle-east-news/former-syrian-general-assad-planned-to-transfer-chemical-weapons-to-hezbollah-1.465574>, Accessed on: April 26, 2017.

⁴² The Telegraph, <http://www.telegraph.co.uk/news/2017/04/14/bashar-al-assad-still-has-hundreds-tonnes-chemical-weapons-former/>, Accessed on: May 9, 2017.

Well before the Syrian civil war, the Baathist elite knew that in the case of regime change, their fate would be different from the Soviet *nomenklatura* in contemporary Russian Federation. In other words, a ‘Middle East style’ transition would seal the fate of the Baathist elite, leaving them completely out of power, and most likely without their lives.⁴³ Furthermore, under such a transition, the military and intelligence apparatuses of the regime would immediately collapse, leading to an unsafe environment surrounded by those who suffered from the Baath rule for decades. Therefore, the concept of ‘last resort’ in the eyes of the Syrian elite should not be confused with the same terminology from a Western defense planner’s standpoint. For the Syrian Baathist elite, ‘last resort’ is tantamount to a meaningful loss of military initiative in the civil war’s trajectory that could potentially lead to irreversible political collapse. In this respect, Assad’s generals tend to act highly responsively – and aggressively – when it comes to halting opposing advances even in early stages.

At this point, one should pay attention to the very fact that like all wars in military history, the Syrian civil war is essentially about geography. Thus, developing a thorough understanding of the regime’s geopolitical approach to the conflict will establish a clear idea about its military strategy and operational art.

Prior to Russian intervention in the civil war, the regime forces’ control of territory had drastically reduced to some 17% of its initial terrain. By late Summer 2015, the regime’s military–geostrategic priorities were to defend Damascus, Homs, and Hama in the south – north axis, keeping Latakia and Tartous under control, since these latter provinces serve both as an Alawite powerhouse as well as a Mediterranean gateway, and to keep an acceptable level of lines of communication with Aleppo in the north through the M5 highway. In this geopolitical equation, the Homs – Hama axis remains the principal choke point connecting the critical coastline with the Damascus – Aleppo vertical.⁴⁴

The M5 highway facilitates the main connection between Aleppo and Damascus. Keeping lines of communication along this critical geopolitical asset has always been a must for the regime. Had rebel groups managed to isolate Aleppo, they would have gained the governance center necessary to challenge Assad’s political authority with a viable alternative. This is why the fiercest clashes of the Syrian civil war took place along the M5 highway; for instance the battle for Saraqeb and the battle for Ma’arat al-Numan. Khan Shaykun, the town in Idlib that witnessed the recent chemical atrocity, also comes to mind as another choke point along the M5 highway.

Notably, the regime’s chemical weapons record is consistent with its geopolitical approach to the conflict. In this regard, Khan al-Assal, a key position in Aleppo, was targeted by a CW attack in 2013.⁴⁵ The same year, in late April, the town of Saraqeb witnessed chemical attacks. Differing from the Khan al-Assal CW strike, where Su-22s were the principal delivery platforms, current evidence suggest that Saraqeb was hit by chemical canisters dropped from regime helicopters.⁴⁶ Furthermore, the Baathist regime

⁴³ Shmuel, Bar. “Bashar’s Syria: The Regime and Its Strategic Worldview, Comparative Strategy, No: 25, pp. 353-445. 2006.

⁴⁴ IHS Jane’s, <http://www.janes.com/article/53771/syrian-government-no-longer-controls-83-of-the-country>, Accessed on: April 27, 2017.

⁴⁵ NTI, <http://www.nti.org/learn/countries/syria/chemical/>, Accessed on: April 27, 2016.

⁴⁶ Bellingcat, <https://www.bellingcat.com/news/mena/2017/04/27/revisiting-syrias-2013-sarin-attack-saraqeb-idlib/>, Accessed on: May 1, 2017.

has not always commissioned its air force for CW delivery missions. In this respect, the Ghouta attacks of August 2013 were carried out by Assad's missile forces.⁴⁷

The underlying military-geopolitical motivations for the Ghouta chemical attack differ from those in Saraqeb, Khan al-Assal, and Khan Shaykun. The Ghouta massacre was more so about the regime's vital interests in Damascus.

Stemming from the Hafez al-Assad rule, the Syrian Arab Armed Forces have always had a formidable posture in the capital. In doing so, Hafez al-Assad had two strategic objectives. The first was to protect his capital from an Israeli invasion advancing from potential attack positions in the Golan Heights. The second was purely about regime security. Al-Assad rule has not only militarized Damascus but has also intentionally changed its demographics. As a result of the regime's demographical perspective since the 1970s, prior to the civil war, a quarter of Syria's Alawites have lived in Damascus.⁴⁸ Furthermore, this sectarian foundation has had a 'micro-geopolitical' dimension as well. The Baathist regime's population power-base was distributed to strategic locations, namely in proximity to the presidential residence, close to Mazzeh military base, and in suburban towns previously dominated by Druzes and Christians.

Notably, conservative Sunni suburbs of Damascus, such as Douma and Zamalka, have become epicenters for the opposition. Beginning during the Hafez al-Assad era, the regime encouraged the expansion of its favored centers to establish lines of communication between Damascus, the rest of the country, and Lebanon.⁴⁹ Another aim of the expansion was to separate West and East Ghouta, as well as to protect the strategic road between the airport and Damascus, which retains the city's international connections. Geopolitically, holding onto Damascus ensures regime security for Assad's forces, and enables Baathist rule to manifest its freedom of movement vis a vis its allies.⁵⁰

Back in 2013, the Ghouta CW attack aimed to stop the opposition's advances towards the very heart of the regime. A major setback in the Damascus area could have easily led to a rapid 'domino-effect' for the Syrian military's cohesion and discipline.

However, despite differing geopolitical motives and civilian casualties, some experts find interesting similarities between the 2013 Ghouta and the 2017 Khan Shaykun chemical attacks. First, evidence shows that the sarin nerve agent was used in both cases. Second, despite the fact that delivery means and platforms differed in Ghouta and Khan Shaykun, planning aspects (approximate operation launch time, narrow command chain, preference of non-persistent nerve agents, targets) show significant overlaps. Finally, population displacement and halting rebel advance through utilizing non-persistent agents were the strategic goals in both CW strikes.⁵¹

⁴⁷ For detailed info, see: Human Rights Watch, *Attacks on Ghouta: Analysis of Alleged Use of Chemical Weapons in Syria*, 2013.

⁴⁸ Fabrice, Balanche. "Damascus Control Emboldens Assad Nationally", *The Washington Institute for Near East Policy*, August 2016.

⁴⁹ Ibid.

⁵⁰ Ibid.

⁵¹ Dany, Shoham. "The Sarin Attacks of August 2013 and April 2017", *BESA Perspective Paper No: 452*, April 2017.

From a military standpoint, the significant continuity found in CW patterns in Syria strongly suggests a doctrinally organized planning and execution, which demands professional offensive chemical warfare expertise, such as the one the regime has developed for the past few decades. In this regard, CNN's reporting on the interception of the Syrian military's communications with chemical experts is noteworthy. According to a senior US official, an immediate review of the captured unprocessed intelligence revealed that a – probably re-established after the 2013 disarmament – Syrian unit was in communication with the related chain of command and chemical experts, and Bashar al-Assad was involved in the CW use decision.⁵²

At this point, some critiques argued that the regime had 'no reason' to use its chemical arsenal. Yet, as explained earlier, Assad's forces' military activities along critical choke points, such as Khan Shaykun, indicate that recent CW use was not an exception. Furthermore, given the complexities of the battlefield in Idlib, coupled with this province's military importance regarding Hama, a key hub linking the capital to Aleppo in the north and the Mediterranean gateway to the west, the regime probably saw many practical benefits in CW use.⁵³ Apparently, Assad's forces designed a massive depopulation of Idlib's adjacent areas with Hama. By doing so, the Baathist military planners probably aimed to 'fix' the Idlib 'human terrain' for a follow-up massive incursion. Clearly, what they did not calculate was the significant shift in the White House's strict determination to respect red lines on CW use.

Carrying Out the Dirty Job: Tactical Link of the WMD Chain

Resembling the narrow upper crust of the strategic weapons top chain of command, once the decision is made, tactical execution on the battlefield also relies on a few operational commanders and special units loyal to Assad.

So far, we have two important clues about Khan Shaykun chemical massacre. First, some generals from the Syrian Air and Air Defense Forces, who were previously sanctioned due to their involvement in the chemical weapons program and activities, were operationally commanding Shayrat Airbase. Second, elements from the regime's elite Tiger Forces unit, as well as its commander, General Suheil al-Hassan – who has a record of using chemical barrel bombs and comes from the ranks of Air Force Intelligence – were deployed in the area of operations between Idlib and Hama.

The Suspected Air Force Link

Let's begin with assessing the first critical link, the Syrian Air and Air Defense Force.

Shayrat Airbase is a key asset for the regime because it hosts the Su-22 variants for land-attack role.⁵⁴ Furthermore, experts report that the airbase is one of the few facilities with the capability of loading chemical precursors and munitions, which is a vital function for CW operations. The base falls under the Syrian Arab Air Force's 22nd Division's area of responsibility. The 22nd Syrian Arab Air Force Division is responsible for operations in the northern part of the country, including Hama, Idlib,

⁵² CNN, <http://edition.cnn.com/2017/04/12/politics/us-intelligence-syrian-chemical-weapons/>, Accessed on: May 3, 2017.

⁵³ Mohanad Hage, Ali. "The 'No Motive' Myth", Carnegie Middle East Center, April 2017.

⁵⁴ IHS Jane's, Syria – Air Force, 2017.

and Aleppo. The Division is commanded by Major General Saji Jamil Darwish.⁵⁵ General Darwish has already been sanctioned by the EU and the United States for his involvement in previous chemical attacks launched from the bases under his control.⁵⁶

Furthermore, Major General Darwish is surrounded by ‘problematic’ generals with CW records at both higher and lower ranks, which suggests that the Khan Shaykun attack was probably the work of a narrow but top-down chain within the highest levels of the Syrian Arab Air Force, rather than individual decisions from renegade elements. In this regard, the 63rd Syrian Arab Air Force Brigade, which is a 22nd Division subordinate helicopter unit based in Hama, is a unit with a CW record. Both the commander of the unit, Brigadier General Badi Mualla, and the deputy commander, Brigadier General Muhammad Ibrahim,⁵⁷ have been involved in CW activities and were consequentially sanctioned.⁵⁸ Given the previously explained military geostrategic importance of Khan Shaykun for the regime presence in Hama, it is likely that Major General Darwish’s subordinates did not exclude a chemical option from their decision proposals. Likewise, regarding the fact that the Syrian Arab Air Force’s and the Air Force Intelligence’s top commands have already included CW authorization in previous cases, this report estimates that General Darwish probably found himself in a determined consensus stemming from both superiors and subordinates.

Last but not least, some press sources have recently released news stories reporting the tactical component of the April 4 attacks. According to these reports, Brigadier General Mohammad Hasouri, the Su-22 squadron commander flying with the Quds-1 banner, personally carried out the CW delivery mission.⁵⁹ In other words, General Hasouri’s communications prior to April 4 remain very critical for tracing details of the Khan Shaykun attack.

Calling in the Chemical Strike

The most significant piece of evidence indicating a chemical attack, which was ‘planned and executed within the hierarchy’, is the US intelligence’s findings about the ‘Shayrat connection’. According to the de-classified reports following the Khan Shaykun attack, US intelligence concluded that *“personnel historically associated with Syria's chemical weapons program were at Shayrat Airfield in late March making preparations for an upcoming attack in Northern Syria, and they were present at the airfield on the day of the attack”*.⁶⁰

⁵⁵ Gregory, Koblenz. “Syrian Chemical Weapons Kill Chain”, Foreign Policy, April 7, 2017.

⁵⁶ For the US sanctions, see: <https://www.treasury.gov/press-center/press-releases/Pages/jl0701.aspx>, Accessed on: May 7, 2017; for the EU sanctions, see: <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32017R0480>, Accessed on: May 7, 2017.

⁵⁷ Gregory, Koblenz. “Syrian Chemical Weapons Kill Chain”, Foreign Policy, April 7, 2017.

⁵⁸ The US Department of the Treasury, <https://www.treasury.gov/resource-center/sanctions/OFAC-Enforcement/Pages/20170112.aspx>, Accessed on: May 7, 2017.

⁵⁹ <https://www.thetimes.co.uk/article/pilot-of-sarin-gas-jet-flew-in-previous-chemical-attack-3pn62d3xw>, Accessed on: May 9, 2017; http://orient-news.net/en/news_show/134606/Perpetrator-of-second-largest-chemical-attack-in-Syria-identified, Accessed on: May 9, 2017.

⁶⁰ For the full text of the US intel, see: <https://fas.org/irp/news/2017/04/wh-assad.pdf>, Accessed on: May 9, 2017.

At this point, an important question needs to be addressed: which unit informed the regime's top military command about the 'need' to employ tactical chemical warfare capabilities in Khan Shaykun and requested the strike?

Before carrying on with available open-source intel on regime operations between the Hama countryside and the south of Idlib, as of late March and early April, we should first explain some key facts about the shifts in the Syrian Arab Army's doctrinal order of battle throughout the course of the civil war.

In 2011 and 2012, the Baathist regime had lost control of nearly half of its infantry formations. Military estimates suggest that the Syrian Arab Armed Forces' manpower drastically dropped from 325,000 in 2011 to some 178,000 in 2013.⁶¹ In order to overcome personnel shortcomings, the regime opted for mobilization of their reserves in 2012. Although the reserve mobilization mostly failed, the regime established popular armed groups called the National Defense Forces to compensate for the light infantry gap and received critical help from the Iranian Revolutionary Guards' Quds Forces as well as from the Lebanese Hezbollah. Besides, Russian airpower and military advisers have been playing a key role in keeping the regime alive.⁶² As of 2017, IISS' Military Balance makes the following assessment for the regime's land forces: *"The army can be split into two groups: the first composed of approximately 25,000 fighters from the 4th Armored Division, the Republican Guard and the Special Forces comprises the majority of the regime's effective military power; the remaining approximately 65,000 personnel are largely tasked with holding government territory. Many formations are under-strength, at an estimated 500–1,000 personnel in brigades and regiments"*.⁶³

Furthermore, given manpower gaps, the regime adopted a new military geostrategic approach, which could be depicted as 'selective deployment'. In this context, Assad's defense planners were well aware that they could deploy reliable combat power to any front at any given time, but they were not able to run a multi-front battle for very long. However, this manner of conduct is not new to Syrian military strategic culture. Selective deployment of elite units, reliable in ethno-sectarian and political terms, was exactly how Hafez al-Assad handled the Muslim Brotherhood uprising in Hama in the early 1980s.⁶⁴ On a separate note, the regime's chemical agent of choice was hydrogen cyanide during the 1982 Hama counterinsurgency campaign.⁶⁵

In recent years, the regime has promoted special units with high 'public relations efforts' and tailor-made tasks for fierce offensives. The most widely-known of these elite formations is the Tiger Forces. According to pro-regime sources, the Tiger Forces were established in 2013 by a highly-decorated officer, Colonel – at the time – Suheil al-Hassan. He came from the regime's power-base, Latakia, and climbed the ranks of the Syrian Air Force Intelligence through swift promotions. Al-Hassan established the unit following the regime's request for the formation of a special force focusing on

⁶¹ For a detailed assessment of the manpower issues within the Syrian Arab Armed Forces, see: Lucas, Winter. Manpower Gaps in the Syrian Army, The US Army Foreign Military Studies Office, 2016.

⁶² Ibid.

⁶³ IISS, Military Balance 2017, Routledge, London, 2017, p.404.

⁶⁴ Joseph Holliday, The Assad Regime: From Counterinsurgency to Civil War, Institute for the Study of War, 2013, pp.10-11.

⁶⁵ <http://www.globalsecurity.org/wmd/world/syria/hama.htm>, Accessed on: May 9, 2017.

counterinsurgency against robust opposition groups.⁶⁶ General al-Hassan's military personality is so polished by the regime that he was promoted to the rank of major general at the same time as Maher al-Assad – Bashar al-Assad's brother –, and named 'one of the most popular commanders' by pro-regime press sources.⁶⁷

Essentially, General Suheil al-Hassan can be depicted as one of the 'embodied manifestations' of Assad's military machine on the battleground. As the Syrian Baathist regime's own, General al-Hassan has been advertised by Damascus for two reasons. First, the regime needs heroes to keep its supporters sharp and mobilized. And second, the regime needs its own heroes to keep the 'Syrian character' of its security apparatus, which has already been overshadowed by heavy Iranian and Russian influence.

Biographical intelligence assessments of Suheil al-Hassan suggest that the general came into the picture as a result of his scorch-earth campaign in Hama in 2011, where he was appointed to oversee the Syrian Air Force Intelligence's detention center, and to coordinate the counterinsurgency effort from the Hama airbase. As of 2012, al-Hassan had already assumed command of an elite task force from the 4th Armored Division's detachments, armor and heavy weapons from the 11th Division, as well as Air Force assets deployed in the Hama Airbase. At the epicenter of General al-Hassan's battle record, his abilities to 'force' subordinates in combined operations by overcoming chronic discipline and organization problems, and using systematic barrel bombs drew attention.⁶⁸ As a matter of fact, General al-Hassan was sanctioned due to chemical barrel bomb employment in Syria.⁶⁹

In particular, a careful review of open-source intel obtained from pro-regime press and social media accounts suggests that Tiger Forces units were concentrated along the Idlib – Hama axis for operations before the Khan Shaykun CW attack,⁷⁰ and there is visual evidence suggesting General Suheil al-Hassan was the operational commander on the ground.⁷¹

More importantly, the aforementioned biographical analysis shows that al-Hassan is capable of linking operating ground units with air force elements and strategic weapons, without refraining from mass killings of the civilian population; his military assessments also seem to be taken very seriously by the regime.

At this stage, open-source intelligence analysis of a think-tank report reaches to its limits. To precisely highlight the links between General al-Hassan and the 22nd Air Division, and to trace these links to the top until Bashar al-Assad's CW authorization, one would need classified information, such as the precise signals intelligence inputs. In this regard, it is still unknown whether the SIGINT intercepted by the US intelligence⁷²

⁶⁶ Al-Masdar News, <https://www.almasdarnews.com/article/colonel-suheil-al-hassan-tiger-forces/>, Accessed on: May 7, 2017.

⁶⁷ Al Masdar News, <https://www.almasdarnews.com/article/maher-al-assad-suheil-al-hassan-official-accept-military-promotions/>, Accessed on: May 9, 2017.

⁶⁸ Lucas, Winter. "Suheil al-Hassan and the Syrian Army's Tiger Forces", Small Wars Journal, July 2016.

⁶⁹ The US Department of the Treasury, <https://www.treasury.gov/resource-center/sanctions/OFAC-Enforcement/Pages/20170112.aspx>, Accessed on: May 7, 2017.

⁷⁰ Al Masdar News, <https://www.almasdarnews.com/article/syrian-army-storms-checkpoints-northern-hama-liberation-six-villages-map-update/>, Accessed on: May 9, 2017.

⁷¹ <https://mobile.twitter.com/mmagreen/status/845264426164998144>, Accessed on: May 9, 2017.

⁷² <http://edition.cnn.com/2017/04/12/politics/us-intelligence-syrian-chemical-weapons/>, Accessed in: May 7, 2017.

covers direct communications between General Suheil al-Hassan and General Saji Jamil Darwish. Yet, we have enough evidence to predict that the operational commander's assessments of the tactical situation and the 22nd Air Division's tendency to use chemical weapons, coupled with the regime's top WMD chain of command's – and Assad's – willingness and geopolitical calculus, had led the way to the Khan Shaykun massacre.

Conclusion

This report concludes that the Khan Shaykun chemical attack by the Syrian Baathist regime was **inevitable yet preventable**.

It was inevitable and preventable due to a number of reasons at policy, military–strategic, and operational levels.

At the policy level, previous fluctuations with so-called “red lines” following the 2013 Ghouta attack, and inaction on the part of the international community in the face of Assad's forces' systematic chlorine and barrel bomb use, have all unintentionally encouraged the regime by further weakening the already problematic deterrence factors. In other words, the Baathist elite felt perfectly safe with ‘moderately’ deceiving the chemical deal and employing tactical-level, non-persistent chemical agents. They probably calculated that unless strategic chemical warfare assets, like VX, are delivered in large amounts, they could get away with ‘condemning’ rhetoric, increased sanctions, or reminders of – once lost – firm red lines that attempt to protect international norms. In fact, the Trump administration's punitive and surgical Tomahawk strike did not only target Shayrat airbase, but more precisely, the Baathist elite's undeserved confidence.

At the military–strategic level, the regime's de-population patterns since the outset of the civil war, coupled with several intelligence predictions suggesting CW capabilities were retained, illuminated the resulting consequence of Khan Shaykun. Another military – strategic factor that led to the April 4 attacks, that still exists, is the radical faction of the high command of the Syrian Arab Armed Forces, and President Bashar al-Assad's endorsement of these shady military chiefs; not to mention their problematic concepts such as barrel bombing, indiscriminate shelling, employing militiamen alongside regular forces, and using chemical warfare assets.

At the operational level, the previously obtained intelligence on the 22nd Air Division's high command, intensive Tiger Forces activity in the Hama – Idlib area, and heavy clashes along the M5 highway should have alerted experts about a coming CW attack, specifically targeting one of the choke points, such as Khan Shaykun. Probably, the operational surprise was the use of a nerve agent rather than a heavy chlorine – tipped barrel bomb salvo.

In conclusion, the April 4 Idlib chemical attack was a perfect example of the regime's geopolitical approach to the conflict and its strategic perspective regarding the utility of chemical weapons. On the other hand, the April 7 intervention, namely the Tomahawk strikes ordered by President Trump, marked the most tangible attempt to reverse the ‘Ghouta 2013 legacy’, which paved the ground for Khan Shaykun. Further trajectory of the Syrian civil war will reveal whether the April 4 or the April 7 paradigm will prevail.