Dear Larry:

I am responding to your distribution of what I understand is a White House statement claiming intelligence findings about the nerve agent attack on April 4, 2017 in Khan Shaykhun, Syria. My understanding from your note is that this White House intelligence summary was released to you sometime on April 11, 2017.

I have reviewed the document carefully, and I believe it can be shown, without doubt, that the document does not provide any evidence whatsoever that the US government has concrete knowledge that the government of Syria was the source of the chemical attack in Khan Shaykhun, Syria at roughly 6 to 7 a.m. on April 4, 2017.

In fact, a main piece of evidence that is cited in the document points to an attack that was executed by individuals on the ground, not from an aircraft, on the morning of April 4.

This conclusion is based on an assumption made by the White House when it cited the source of the sarin release and the photographs of that source. My own assessment, is that the source was very likely tampered with or staged, so no serious conclusion could be made from the photographs cited by the White House.

However, if one assumes, as does the White House, that the source of the sarin was from this location and that the location was not tampered with, the most plausible conclusion is that the sarin was dispensed by an improvised dispersal device made from a 122 mm section of rocket tube filled with sarin and capped on both sides.

The only undisputable facts stated in the White House report is the claim that a chemical attack using nerve agent occurred in Khan Shaykhun, Syria on that morning. Although the White House statement repeats this point in many places within its report, the report contains absolutely no evidence that this attack was the result of a munition being dropped from an aircraft. In fact, the report contains absolutely no evidence that would indicate who was the perpetrator of this atrocity.

The report instead repeats observations of physical effects suffered by victims that with very little doubt indicate nerve agent poisoning.

The only source the document cites as evidence that the attack was by the Syrian government is the crater it claims to have identified on a road in the North of Khan Shaykhun.

I have located this crater using Google Earth and there is absolutely no evidence that the crater was created by a munition designed to disperse sarin after it is dropped from an aircraft.

The Google Earth map shown in Figure 1 at the end of this text section shows the location of that crater on the road in the north of Khan Shaykhun, as described in the White House statement.

The data cited by the White House is more consistent with the possibility that the munition was placed on the ground rather than dropped from a plane. This conclusion assumes that the crater was not tampered with prior to the photographs. However, by referring to the munition in this crater, the White House is indicating that this is the erroneous source of the data it used to conclude that the munition came from a Syrian aircraft.
Analysis of the debris as shown in the photographs cited by the White House clearly indicates that the munition was almost certainly placed on the ground with an external detonating explosive on top of it that crushed the container so as to disperse the alleged load of sarin.

Since time appears to be of the essence here, I have put together the summary of the evidence I have that the White House report contains false and misleading conclusions in a series of figures that follow this discussion. Each of the figures has a description below it, but I will summarize these figures next and wait for further inquiries about the basis of the conclusions I am putting forward herein.

**Figure 1** shows a Google Earth image of the northeast corner of Khan Shaykhun where the crater identified as the source of the sarin attack and referred to in the White House intelligence report is located.

Also shown in the Google Earth image is the direction of the wind from the crater. At 3 AM the wind was going directly to the south at a speed of roughly 1.5 to 2.5 m/s. By 6 AM the wind was moving to the southeast at 1 to 2 m/s. The temperature was also low, 50 to 55°F near the ground. These conditions are absolutely ideal for a nerve agent attack.

When the temperature near the ground is low, and there is no sun and very slow winds, the dense cool air stays close to the ground and there is almost no upward motion of the air. This condition causes any particles, droplets, or clouds of dispersed gas to stay close to the ground as the surrounding air moves over the ground. We perceive this motion as a gentle breeze on a calm morning before sunrise.

One can think of a cloud of sarin as much like a cloud of ink generated by an escaping octopus. The ink cloud sits in the water and as the water slowly moves, so does the cloud. As the cloud is moved along by the water, it will slowly spread in all directions as it moves. If the layer of water where the ink is embedded moves so as to stay close to the ocean floor, the cloud will cover objects as it moves with the water.

This is the situation that occurs on a cool night before sunrise when the winds move only gently.

**Figures 5 and 6** show tables that summarize the weather at 3 hour intervals in Khan Shaykun on the day of the attack, April 4, the day before the attack, April 3, and the day after the attack, April 5. The striking feature of the weather is that there were relatively high winds in the morning hours on both April 3 and April 5. If the gas attack were executed either the day before or the day after in the early morning, the attack would have been highly ineffective. The much higher winds would have dispersed the cloud of nerve agent and the mixing of winds from higher altitudes would have caused the nerve agent to be carried aloft from the ground. It is therefore absolutely clear that the time and day of the attack was carefully chosen and was no accident.

**Figure 2** shows a high quality photograph of the crater identified in the White House report as the source of the sarin attack. Assuming that there was no tampering of evidence at the crater, one can see what the White House is claiming as a dispenser of the nerve agent.

The dispenser looks like a 122 mm pipe like that used in the manufacture of artillery rockets.

As shown in the close-up of the pipe in the crater in **Figure 3**, the pipe looks like it was originally sealed at the front end and the back end. Also of note is that the pipe is flattened into the crater, and also has a fractured seam that was created by the brittle failure of the metal skin when the pipe was suddenly crushed inward from above.

**Figure 4** shows the possible configuration of an improvised sarin dispersal device that could have been used to create the crater and the crushed carcass of what was originally a cylindrical pipe. A good guess of how this dispersal mechanism worked (again, assuming that the crater and carcass were not staged, as assumed in the White House report) was that a slab of high explosive was placed over one end of the sarin-filled pipe and detonated.

The explosive acted on the pipe as a blunt crushing mallet. It drove the pipe into the ground while at the same time creating the crater. Since the pipe was filled with sarin, which is an incompressible fluid, as the pipe was flattened the sarin acted on the walls and ends of the pipe causing a crack along the length of the
pipe and also the failure of the cap on the back end. This mechanism of dispersal is essentially the same as hitting a toothpaste tube with a large mallet, which then results in the tube failing and the toothpaste being blown in many directions depending on the exact way the toothpaste skin ruptures.

If this is in fact the mechanism used to disperse the sarin, this indicates that the sarin tube was placed on the ground by individuals on the ground and not dropped from an airplane.

Figure 8 shows the improvised sarin dispenser along with a typical 122 mm artillery rocket and the modified artillery rocket used in the sarin attack of August 21, 2013 in Damascus.

At that time (August 30, 2013) the Obama White House also issued an intelligence report containing obvious inaccuracies. For example, that report stated without equivocation that the sarin carrying artillery rocket used in Damascus had been fired from Syrian government controlled areas. As it turned out, the particular munition used in that attack could not go further than roughly 2 km, very far short of any boundary controlled by the Syrian government at that time. The White House report at that time also contained other critical and important errors that might properly be described as amateurish. For example, the report claimed that the locations of the launch and impact of points of the artillery rockets were observed by US satellites. This claim was absolutely false and any competent intelligence analyst would have known that. The rockets could be seen from the Space-Based Infrared Satellite (SBIRS) but the satellite could absolutely not see the impact locations because the impact locations were not accompanied by explosions. These errors were clear indicators that the White House intelligence report had in part been fabricated and had not been vetted by competent intelligence experts.

This same situation appears to be the case with the current White House intelligence report. No competent analyst would assume that the crater cited as the source of the sarin attack was unambiguously an indication that the munition came from an aircraft. No competent analyst would assume that the photograph of the carcass of the sarin canister was in fact a sarin canister. Any competent analyst would have had questions about whether the debris in the crater was staged or real. No competent analyst would miss the fact that the alleged sarin canister was forcefully crushed from above, rather than exploded by a munition within it. All of these highly amateurish mistakes indicate that this White House report, like the earlier Obama White House Report, was not properly vetted by the intelligence community as claimed.

I have worked with the intelligence community in the past, and I have grave concerns about the politicization of intelligence that seems to be occurring with more frequency in recent times – but I know that the intelligence community has highly capable analysts in it. And if those analysts were properly consulted about the claims in the White House document they would have not approved the document going forward.

I am available to expand on these comments substantially. I have only had a few hours to quickly review the alleged White House intelligence report. But a quick perusal shows without a lot of analysis that this report cannot be correct, and it also appears that this report was not properly vetted by the intelligence community.

This is a very serious matter.

President Obama was initially misinformed about supposed intelligence evidence that Syria was the perpetrator of the August 21, 2013 nerve agent attack in Damascus. This is a matter of public record. President Obama stated that his initially false understanding was that the intelligence clearly showed that Syria was the source of the nerve agent attack. This false information was corrected when the then Director of National Intelligence, James Clapper, interrupted the President while he was in an intelligence briefing. According to President Obama, Mr. Clapper told the President that the intelligence that Syria was the perpetrator of the attack was “not a slamdunk.”

The question that needs to be answered by our nation is how was the president initially misled about such a profoundly important intelligence finding? A second equally important question is how did the White House produce an intelligence report that was obviously flawed and amateurish that was then released to
the public and never corrected? The same false information in the intelligence report issued by the White House on August 30, 2013 was emphatically provided by Secretary of State John Kerry in testimony to the Senate Foreign Relations Committee!

We again have a situation where the White House has issued an obviously false, misleading and amateurish intelligence report.

The Congress and the public have been given reports in the name of the intelligence community about weapons of mass destruction in Iraq, technical evidence supposedly collected by satellite systems that any competent scientists would know is false, and now from photographs of the crater that any analyst who has any competent at all would not trust as evidence.

It is late in the evening for me, so I will end my discussion here.

I stand ready to provide the country with any analysis and help that is within my power to supply. What I can say for sure herein is that what the country is now being told by the White House cannot be true and the fact that this information has been provided in this format raises the most serious questions about the handling of our national security.

Sincerely yours, Theodore A. Postol

Theodore A. Postol

Professor Emeritus of Science, Technology, and National Security Policy
Massachusetts Institute of Technology
Email: postol@mit.edu
Cell Phone: 617 543-7646
Direction of lethal Plume on April 4, 2017 between 3 and 6 AM on April 4, 2017 assuming the munition crater identified by the White House report is actually a sarin dispersal site

Figure 1

Close up photograph of the crater that has been shown in numerous mainstream media publications that the White House alleges is proof that the source of the nerve agent attack was the Syrian government.

Figure 2
Deformation of sarin containing pipe and crater from the action of the explosive charge placed on top of the sarin containing pipe. Note that pipe has been flattened from the outside and has failed along its length and at the far end due to the action of the incompressible sarin fluid against the pipe walls.

**Figure 3**

Possible configuration of an improvised sarin dispersal device that uses an externally placed explosive and a sealed pipe that has been filled with sarin that could potentially contain 8 to 10 L of sarin.

**Figure 4**
The weather at the time of the attack was ideal for the most lethal spread of the nerve agent. The ground was cool and there was a high density layer of air near the ground that would carry the nerve agent close to the ground as it drifted towards its victims. The wind speed was also very low, which resulted in the sarin taking a long time to pass over its victims, resulting in long exposures that made it more likely that victims would get a lethal dose.

Figure 5

The weather on the day before the attack, Monday April 3, and on the day after the attack, Wednesday April 5, had very poor weather for an effective nerve agent attack. The winds were high and gusty on both days, which would have resulted in the sarin being carried away from the ground and quickly over any possible victims, causing a very limited time for them to get a dose that would be lethal.

Figure 6
How the sarin is dispersed by the wind: the graph above shows a rough estimate of how a cloud of sarin droplets might disperse under weather conditions similar to that in the early morning on April 4, 2017 in Khan Shaykhun. As the sarin is carried by the ambient winds, it tends to rise and spread somewhat due to the slight turbulence of the air. Note that the cloud might not disperse much for ranges of thousands of meters downwind. The cross range and vertical dispersion is determined not only by the weather conditions but also by the ground, which if rough could increase the dispersion and if flat and smooth could reduce the dispersion.

Figure 7

The ground-placed improvised sarin dispersal device is shown next to a standard 122 mm artillery rocket and the modified rocket that was used for delivering sarin in the nerve agent attack of August 21, 2013. Unlike the modified artillery rockets used in the nerve agent attack of August 21, 2013 in Damascus, this particular improvised dispersal device is simply a section of pipe from a 122 mm rocket or for the manufacture of 122 mm rockets that could have been filled with sarin. The explosive placed on top of the pipe would cause it to be suddenly crushed up like a tube of toothpaste hit by a mallet. Just as the toothpaste would be sprayed out from the toothpaste tube, so with the sarin be sprayed from the metal tube.

Figure 8
Rough estimate of possible sarin densities and times to lethal exposure from the improvised sarin dispersal device described in the White House report and exploded on the road in Khan Shaykhun.

**Figure 9**

Impact points and poisonous sarin plumes from evaporating pools of nerve agent in some marker between 2 AM and 3 AM on August 21, 2013

**Figure 10**
Appendix
Quotes from the White House Report

The United States is confident that the Syrian regime conducted a chemical weapons attack, using the nerve agent sarin.

We have confidence in our assessment because we have signals intelligence and geospatial intelligence, laboratory analysis of physiological samples collected from multiple victims, as well as a significant body of credible open source reporting, that tells a clear and consistent story.

We assess that Damascus launched this chemical attack in response to an opposition offensive in northern Hamah Province that threatened key infrastructure. Senior regime military leaders were probably involved in planning the attack.

Shaykhun at 6:55 AM local time on April 4.

Our information indicates that the chemical agent was delivered by regime Su-22 fixed-wing aircraft.

Our information indicates 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.

Hours after the April 4 attack, there were hundreds of accounts of victims presenting symptoms consistent with sarin exposure.

Commercial satellite imagery from April 6 showed impact craters around the hospital that are consistent with open source reports of a conventional attack on the hospital after the chemical attack.

An open source video also shows where we believe the chemical munition landed—not on a facility filled with weapons, but in the middle of a street in the northern section of Khan Shaykhun. Commercial satellite imagery of that site from April 6, after the allegation, shows a crater in the road that corresponds to the open source video.

Observed munition remnants at the crater and staining around the impact point are consistent with a munition that functioned.

Last November, for instance, senior Russian officials used an image from a widely publicized regime chemical weapons attack in 2013 on social media platforms to publicly allege chemical weapons use by the opposition.

We must remember that the Assad regime failed to adhere to its international obligations after its devastating attacks on Damascus suburbs using the nerve agent sarin in August 2013, which resulted in more than one thousand civilian fatalities, many of whom were children. The regime agreed at that time to fully dismantle its chemical weapons program, but this most recent attack...
The Assad Regime's Use of Chemical Weapons on April 4, 2017

The United States is confident that the Syrian regime conducted a chemical weapons attack, using the nerve agent sarin, against its own people in the town of Khan Shaykhun in southern Idlib Province on April 4, 2017. According to observers at the scene, the attack resulted in at least 50 and up to 100 fatalities (including many children), with hundreds of additional injuries.

We have confidence in our assessment because we have signals intelligence and geospatial intelligence, laboratory analysis of physiological samples collected from multiple victims, as well as a significant body of credible open source reporting, that tells a clear and consistent story. We cannot publicly release all available intelligence on this attack due to the need to protect sources and methods, but the following includes an unclassified summary of the U.S. Intelligence Community's analysis of this attack.

Summary of the U.S. Intelligence Community's Assessment of the April 4 Attack

The Syrian regime maintains the capability and intent to use chemical weapons against the opposition to prevent the loss of territory deemed critical to its survival. We assess that Damascus launched this chemical attack in response to an opposition offensive in northern Hamah Province that threatened key infrastructure. Senior regime military leaders were probably involved in planning the attack.

A significant body of pro-opposition social media reports indicate that the chemical attack began in Khan Shaykhun at 6:55 AM local time on April 4.

Our information indicates that the chemical agent was delivered by regime Su-22 fixed-wing aircraft that took off from the regime-controlled Shayrat Airfield. These aircraft were in the vicinity of Khan Shaykhun approximately 20 minutes before reports of the chemical attack began and vacated the area shortly after the attack. Additionally, our information indicates 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.

Hours after the April 4 attack, there were hundreds of accounts of victims presenting symptoms consistent with sarin exposure, such as frothing at the nose and mouth, twitching, and pinpoint pupils. This constellation of symptoms is inconsistent with exposure to a respiratory irritant like chlorine—which the regime has also used in attacks—and is extremely unlikely to have resulted from a conventional attack because of the number of victims in the videos and the absence of other visible injuries. Open source accounts posted following the attack reported that first responders also had difficulty breathing, and that some lost consciousness after coming into contact with the victims—consistent with secondary exposure to nerve agent.
By 12:15 PM local time, broadcasted local videos included images of dead children of varying ages. Accounts of a hospital being bombed began to emerge at 1:10 PM local, with follow-on videos showing the bombing of a nearby hospital that had been flooded with victims of the sarin attack. Commercial satellite imagery from April 6 showed impact craters around the hospital that are consistent with open source reports of a conventional attack on the hospital after the chemical attack. Later on April 4, local physicians posted videos specifically pointing out constricted pupils (a telltale symptom of nerve agent exposure), medical staff with body suits on, and treatments involving atropine, which is an antidote for nerve agents such as sarin.

We are certain that the opposition could not have fabricated all of the videos and other reporting of chemical attacks. Doing so would have required a highly organized campaign to deceive multiple media outlets and human rights organizations while evading detection. In addition, we have independently confirmed that some of the videos were shot at the approximate times and locations described in the footage.

Further, the World Health Organization stated on April 5 that its analysis of the victims of the attack in Syria showed they had been exposed to nerve agents, citing the absence of external injuries and deaths due to suffocation. Doctors without Borders (Medecins Sans Frontieres; MSF) said that medical teams treating affected patients found symptoms to be consistent with exposure to a neurotoxic agent such as sarin. And Amnesty International said evidence pointed to an air-launched chemical attack. Subsequent laboratory analysis of physiological samples collected from multiple victims detected signatures of the nerve agent sarin.

Refuting the False Narratives

The Syrian regime and its primary backer, Russia, have sought to confuse the world community about who is responsible for using chemical weapons against the Syrian people in this and earlier attacks. Initially, Moscow dismissed the allegations of a chemical weapons attack in Khan Shaykhun, claiming the attack was a "prank of a provocative nature" and that all evidence was fabricated. It is clear, however, that the Syrian opposition could not manufacture this quantity and variety of videos and other reporting from both the attack site and medical facilities in Syria and Turkey while deceiving both media observers and intelligence agencies.

Moscow has since claimed that the release of chemicals was caused by a regime airstrike on a terrorist ammunition depot in the eastern suburbs of Khan Shaykhun. However, a Syrian military source told Russian state media on April 4 that regime forces had not carried out any airstrike in Khan Shaykhun, contradicting Russia's claim. An open source video also shows where we believe the chemical munition landed—not on a facility filled with weapons, but in the middle of a street in the northern section of Khan Shaykhun. Commercial satellite imagery of that site from April 6, after the allegation, shows a crater in the road that corresponds to the open source video.
Moscow has suggested that terrorists had been using the alleged ammunition depot to produce and store shells containing toxic gas that they then used in Iraq, adding that both Iraq and international organizations have confirmed the use of such weapons by militants. While it is widely accepted that the Islamic State of Iraq and Syria (ISIS) has repeatedly used sulfur mustard on the battlefield, there are no indications that ISIS was responsible for this incident or that the attack involved chemicals in ISIS's possession.

Moscow suggested this airstrike occurred between 11:30 AM and 12:30 PM local time on April 4, disregarding that allegations first appeared on social media close to 7:00 AM local time that morning, when we know regime aircraft were operating over Khan Shaykhun. In addition, observed munition remnants at the crater and staining around the impact point are consistent with a munition that functioned, but structures nearest to the impact crater did not sustain damage that would be expected from a conventional high-explosive payload. Instead, the damage is more consistent with a chemical munition.

The Syrian regime has used other chemical agents in attacks against civilians in opposition held areas in the past, including the use of sulfur mustard in Aleppo in late 2016. Russia has alleged that video footage from April 4 indicated that victims from this attack showed the same symptoms of poisoning as victims in Aleppo last fall, implying that something other than a nerve agent was used in Khan Shaykhun. However, victims of the attack on April 4 displayed tell-tale symptoms of nerve agent exposure, including pinpoint pupils, foaming at the nose and mouth, and twitching, all of which are inconsistent with exposure to sulfur mustard.

Russia's allegations fit with a pattern of deflecting blame from the regime and attempting to undermine the credibility of its opponents. Russia and Syria, in multiple instances since mid-2016, have blamed the opposition for chemical use in attacks. Yet similar to the Russian narrative for the attack on Khan Shaykhun, most Russian allegations have lacked specific or credible information. Last November, for instance, senior Russian officials used an image from a widely publicized regime chemical weapons attack in 2013 on social media platforms to publicly allege chemical weapons use by the opposition. In May 2016, Russian officials made a similar claim using an image from a video game. In October 2016, Moscow also claimed terrorists used chlorine and white phosphorus in Aleppo, even though pro-Russian media footage from the attack site showed no sign of chlorine use. In fact, our Intelligence from the same day suggests that neither of Russia's accounts was accurate and that the regime may have mistakenly used chlorine on its own forces. Russia's contradictory and erroneous reports appear to have been intended to confuse the situation and to obfuscate on behalf of the regime.

Moscow's allegations typically have been timed to distract the international community from Syria's ongoing use of chemical weapons—such as the claims earlier this week—or to counter the findings from the Organization for the Prohibition of Chemical Weapons (OPCW)-United Nations (UN) Joint Investigative Mechanism (JIM), which confirmed in August and October 2016 reports that the Syrian regime has continued to use chemical
weapons on multiple occasions long after it committed to relinquish its arsenal in 2013. Russia has also questioned the impartial findings of the JIM—a body that Russia helped to establish—and was even willing to go so far as to suggest that the Assad regime should investigate itself for the use of chemical weapons.

Moscow's response to the April 4 attack follows a familiar pattern of its responses to other egregious actions; it spins out multiple, conflicting accounts in order to create confusion and sow doubt within the international community.

**International Condemnation and a Time for Action**

The Assad regime's brutal use of chemical weapons is unacceptable and poses a clear threat to the national security interests of the United States and the international community. Use of weapons of mass destruction by any actor lowers the threshold for others that may seek to follow suit and raises the possibility that they may be used against the United States, our allies or partners, or any other nation around the world.

The United States calls on the world community in the strongest possible terms to stand with us in making an unambiguous statement that this behavior will not be tolerated. This is a critical moment—we must demonstrate that subterfuge and false facts hold no weight, that excuses by those shielding their allies are making the world a more dangerous place, and that the Syrian regime's use of chemical weapons will not be permitted to continue.

We must remember that the Assad regime failed to adhere to its international obligations after its devastating attacks on Damascus suburbs using the nerve agent sarin in August 2013, which resulted in more than one thousand civilian fatalities, many of whom were children. The regime agreed at that time to fully dismantle its chemical weapons program, but this most recent attack—like others before it—are proof that it has not done so. To be clear, Syria has violated its obligations under the Chemical Weapons Convention and the UN Charter, and no drumbeat of nonsensical claims by the regime or its allies can hide this truth. And while it is an embarrassment that Russia has vetoed multiple UN Security Council resolutions that could have helped rectify the situation, the United States intends to send a clear message now that we and our partners will not allow the world to become a more dangerous place due to the egregious acts of the Assad regime.