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SYRIAN CHEMICAL WEAPONS PROGRAM

PROLIFERATION VECTORS, TRANSFER MECHANISMS, AND
CURRENT MATERIAL DISPOSITION



CORE GROUP

Theater: Levant / GCC / European Theater

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I. KEY ANALYTIC JUDGMENTS

The following assessments are produced to Core Group analytical standards. Confidence levels reflect corroboration across forensic chemical attribution, signals intelligence, financial tracing, human intelligence (HUMINT) and open-source intelligence (OSINT). Judgments are current as of April 2026.

KJ-01 HIGH CONFIDENCE

The Assad regime never achieved full chemical weapons disarmament following the 2013 CWC accession. Over 100 undeclared sites—encompassing synthesis laboratories, precursor depots, and munition filling stations—were concealed from OPCW inspectors for over a decade.

KJ-02 MEDIUM CONFIDENCE

Branch 450's extreme mobility doctrine enabled the pre-collapse dispersal of chemical munitions and binary precursors across a minimum of three distinct geographic vectors: the Lebanon corridor (Hezbollah), the eastern Syria desert corridor (residual IS networks), and the Iraqi border zone (Iran-aligned PMF).

KJ-03 HIGH CONFIDENCE

Israeli interdiction operations in December 2024—exceeding 350 precision airstrikes—successfully neutralized primary SSRC nodes at Jamraya, Barzeh, and Masyaf, but cannot be assessed to have achieved comprehensive destruction of all dispersed sub-unit stockpiles given Branch 450's pre-collapse mobility.

KJ-04 MEDIUM-HIGH CONFIDENCE

The forced indigenization of Hezbollah's weapons production in the Bekaa Valley, consequent to the severing of the Syrian land-bridge, constitutes the highest-probability near-term chemical proliferation risk vector in the Levant theater.

KJ-05 MEDIUM CONFIDENCE

The Handasieh-SSRC procurement network, though institutionally decapitated by regime collapse, retains residual commercial relationships across 13 countries. Surviving procurement agents and financial intermediaries—notably UAE- and Oman-based exchange houses—present an ongoing re-acquisition risk if regional actors attempt to reconstitute a clandestine program.

KJ-06 HIGH CONFIDENCE

OPCW IIT forensic methodology—hexamine stabilizer signature and DIMP synthesis byproduct—provides a technically definitive retroactive attribution tool. Any future deployment of SSRC-produced sarin will carry an indelible molecular fingerprint traceable to Institute 3000 feedstocks.

II. PROGRAM SNAPSHOT: SSRC ARCHITECTURE AND LEGACY ASSETS

The Syrian Scientific Studies and Research Center (SSRC/CERS) operated as the undisputed institutional nucleus of the chemical weapons complex. Directed since 2007 by Dr. Omar Mohammad Najib al-Armanazi—subject to EU and US sanctions—the organization employed an estimated 20,000 personnel across a compartmentalized division structure designed to insulate the core synthesis program from external verification.

Institutional Profile	SSRC / CERS
Director	Dr. Omar Mohammad Najib al-Armanazi (sanctioned, EU / US OFAC)
Key Military Liaisons	General Ghassan Abbas; General Bassam al-Hassan (French arrest warrants, crimes against humanity)
Headquarters	Jamraya and Barzeh Districts, Damascus
Personnel (est.)	~20,000 scientists, engineers, and military staff
Reporting Chain	Directly to the Syrian Presidency; outside normal military C2
Status post-Dec 2024	Institutionally collapsed; physical nodes targeted by IDF December 8–10, 2024; personnel disposition unconfirmed

A. Critical Sub-Units and Their Proliferation Relevance

Branch 450 (Classified / Highly Mobile): Assessed as the highest-priority proliferation node. As the sole unit authorized to mix binary precursors and fill munitions, its personnel possess irreplaceable operational and technical knowledge—and, critically, are assessed to have had physical custody of agents in the days preceding regime collapse. Elite praetorian unit responsible for physical custody, transport, and weaponization (munition filling). Personnel drawn predominantly from regime-favored ethno-religious demographics. Assessed to have operationally pre-positioned assets prior to December 8 collapse.

Institute 3000 (Baza / Jamraya): Central synthesis and mass production of nerve and blister agents including sarin and sulfur mustard. Sub-unit Department 3600 managed bulk agent production; subsequently rebranded Institute 6000 for deception purposes.

Institute 4000 (Masyaf, Hama Province): Precision munitions and UAV node; Iranian technology integration hub; suspected Hezbollah transfer staging point. Targeted by IDF Operation Many Ways, September 8, 2024 (Unit 5101 Shaldag ground raid).

Handasieh Network: State-owned industrial umbrella entity (Ministry of Industry) functioning as the primary sanctions-evasion procurement node; OFAC-designated 2012. Subsidiaries include Syronics, Metallic Manufacturing Factory, and General Company for Iron and Steel Products.

III. PROLIFERATION VECTORS: WHERE THE MATERIAL COULD HAVE REACHED

This section provides granular analysis of each assessed proliferation vector, mapping the physical mechanisms, financial conduits, named actors, and material typologies relevant to each pathway. Vectors are ranked by assessed probability of successful material transfer.

A. Vector 1: The Hezbollah / Lebanon Corridor

[PRIORITY]

Historical precedent firmly establishes the Syrian-Lebanese border as the primary artery for weapons transfers to Hezbollah. Prior to regime collapse, Institute 4000 at Masyaf served as an intermediate assembly and transfer hub, integrating Iranian guidance technologies and—per intelligence assessments—potentially chemical payloads into munitions subsequently smuggled via the Anti-Lebanon mountain range.

- **Mechanism of Transfer:** Overland smuggling via subterranean tunnel networks in the Homs Province (Hawsh al Sayyid Ali corridor), raided and sealed by new Syrian authorities in March 2026. Bekaa Valley reception cells coordinated by Hezbollah's 'Golan File' unit operating out of Janta and surrounding fortified areas. Binary precursor components (separately non-lethal) transported as industrial or agricultural cargo through Lebanese border crossings, assembled in-country. Iranian C-130 and charter cargo flights into Beirut Rafic Hariri International Airport: route now closed following Lebanese government ban on Iranian aircraft (post-December 2024).
- **Key Named Actors:** Abu Mohammad al-Julani (Ahmed al-Sharaa): Transitional President; confirmed ordered sealing of Hezbollah tunnel infrastructure—indicates new government assesses prior usage as confirmed. General Ghassan Abbas / General Bassam al-Hassan (SSRC): Operational supervisors of Branch 450 deployment decisions; current whereabouts unknown. IRGC Quds Force logistics officers embedded at Masyaf (Institute 4000): killed or evacuated during September 2024 Shaldag raid.
- **Material at Risk:** Sarin binary precursors (isopropyl alcohol + DF / methylphosphonic difluoride) in separate canister form: assessed most likely transferred prior to full agent mixing. Sulfur mustard (blister agent) in aged shell casings: degraded but deployable. Advanced conventional munitions and GPS-guided missile components: primary confirmed transfer type.
- **Current Status Assessment (April 2026):** The destruction of the Syrian land-bridge and IDF targeting of Bekaa Valley production sites (September 2025 Janta strikes) has substantially degraded Hezbollah's conventional supply chain. UNIFIL has documented over 200 weapons cache sites in southern Lebanon. The residual chemical risk derives from pre-collapse transfers rather than active smuggling. No OPCW-verified detection of SSRC-grade agents in Lebanon has been confirmed in open-source reporting as of April 2026; however, the intensity of Israeli kinetic activity on border corridors in December 2024 suggests allied intelligence assessed active transfer attempts during the chaotic final 72 hours of the regime.

B. Vector 2: Eastern Syria / Residual IS Networks

[ELEVATED RISK]

The Islamic State (IS), despite documented culpability in only five chemical incidents against the regime's 217+, demonstrated operational capacity to acquire and deploy sulfur mustard—specifically attributed at Marea (Aleppo) in September 2015. IS synthesized or captured aging mustard munitions and demonstrated willingness to use them. The security vacuum created by the December 2024 collapse created a finite but critical window during which IS networks operating in the Badia desert and Deir ez-Zor provinces could have accessed unguarded chemical storage points.

- **Mechanism of Transfer:** Direct looting of unguarded Branch 450 dispersal sites during the command collapse window (December 8–10, 2024) before IDF and US strikes neutralized primary nodes. IS facilitation networks in eastern Syria and western Iraq (Anbar Province): established cross-border smuggling of conventional munitions routinely exploited; chemical material represents a capacity extension of existing logistics infrastructure. Capture

of pre-positioned field caches: Branch 450's mobility doctrine included pre-deployed sub-unit caches specifically designed to survive regime interdiction, inadvertently creating accessible stockpiles during the collapse.

- **Material at Risk:** Sulfur mustard (blister agent) in deteriorating munition casings: battlefield-deployable via IED modification. Chlorine cylinders (industrial dual-use): IS demonstrated willingness to weaponize in 2015; widely available throughout Syrian territory. Residual sarin precursors stored at secondary sites not covered in declared inventory.
- **Interdiction Activity:** US military conducted parallel strikes in eastern Syria during December 2024 targeting IS exploitation of the security vacuum. US Central Command (CENTCOM) maintains persistent ISR coverage over Deir ez-Zor and Badia corridors. Transitional Syrian government cooperation with OPCW includes reporting on suspect sites in eastern provinces: over 100 undeclared sites formally confirmed April 2025.

C. Vector 3: Iran / Iraq Axis (PMF Facilitation)

[MEDIUM CONFIDENCE]

Iran's strategic interest in the Syrian chemical program extended beyond proxy support to active technical participation. IRGC engineers embedded within Institute 4000 at Masyaf contributed to precision munitions integration. The collapse of the Assad regime severed Iran's land bridge, but IRGC Quds Force and Iran-aligned Iraqi Popular Mobilization Forces (PMF / al-Hashd al-Sha'bi) operating along the Syrian-Iraqi border zone represent a plausible residual acquisition vector for precursor chemicals or technical documentation.

- **Mechanism of Transfer:** PMF units positioned along the al-Qaim / Abu Kamal border crossing (western Iraq) during the collapse window; documented exploitation of Syrian military equipment abandoned during disintegration of Syrian Arab Army. IRGC knowledge transfer: technical personnel evacuated from Masyaf in September 2024 (pre-collapse) may have carried classified production documentation and synthesis specifications to Iranian facilities. Financial conduit: Arash Sepehri network (Iranian trading company Tajhiz Sanat Shayan / TSS) and UAE-based front companies previously routed US-origin dual-use technology to the Syrian-Iranian defense nexus; this network's residual capacity remains a procurement risk.
- **Key Named Actors:** Arash Sepehri: Iranian procurement agent operating through TSS and UAE front companies; previously identified in SSRC precursor supply chain. Pegasus General Trading (UAE): Third-country logistics hub previously used to circumvent end-user restrictions; current status and sanctions exposure unclear. Korea Mining Development Trading Corp. (KOMID) / OMM / Mirae Shipping: North Korean entities supplying acid-resistant infrastructure materials to SSRC via UAE/Oman transshipment—relationship likely dormant post-collapse but technical contacts survive.

D. Vector 4: European Precursor Re-Acquisition

[SYSTEMIC VULNERABILITY]

The 2014–2016 Brenntag AG / BASF / Sasol Solvents episode established that SSRC procurement agents successfully bypassed EU export controls to acquire 168 tonnes of isopropanol and 280 kilograms of diethylamine—direct sarin and VX precursors—under pharmaceutical cover (Mediterranean Pharmaceutical Industries / MPI, licensed Voltaren manufacturer). This represented active post-CWC precursor re-acquisition while international inspectors operated inside Syria.

- **Mechanism of Exploitation:** Dual-use chemical cover: isopropanol and diethylamine possess simultaneous legitimate pharmaceutical and chemical weapons applications (Table I/II CWC schedules). Layered corporate structure: MPI's licensed subsidiary relationship with Novartis (Voltaren production) provided plausible commercial rationale to European

exporters. Jurisdictional fragmentation: separate criminal complaints in Antwerp, Essen, Hamburg, and Paris reflect the cross-border complexity that allowed evasion of any single national regulator. Transshipment finance via UAE/Oman money service businesses obscured the financial relationship between SSRC and European suppliers.

- Legal and Accountability Status:** French investigative judges issued international arrest warrants against Bashar al-Assad, Maher al-Assad, General Ghassan Abbas, and General Bassam al-Hassan for complicity in crimes against humanity. Criminal complaints filed by Syrian Archive, TRIAL International, and Open Society Justice Initiative across four EU jurisdictions: proceedings ongoing. Dual-use export control reform: EU member states under renewed pressure to implement intelligence-driven corporate compliance screening following the Brenntag precedent.

E. Proliferation Vector Summary Matrix

VECTOR	MECHANISM	KEY ACTORS	MATERIAL	CONF.
Hezbollah / Lebanon	Tunnel networks; air cargo; binary component splitting	IRGC Quds Force; Golan File unit; Branch 450 personnel	Sarin precursors; sulfur mustard; precision munitions	MED
IS / Eastern Syria	Looting of dispersed caches; IED adaptation; Badia corridor	IS Deir ez-Zor cell structure; PMF border units	Sulfur mustard; chlorine cylinders; residual precursors	MED
Iran / Iraq PMF	Technical documentation transfer; al-Qaim border zone; IRGC evacuation	IRGC Quds Force; PMF (al-Hashd); Arash Sepehri network	Synthesis documentation; technical expertise; precursors	MED
European Re-Acquisition	Dual-use pharmaceutical cover; layered EU corporate structure; UAE finance	Brenntag / BASF (unwitting); MPI; UAE exchange houses	Isopropanol (sarin precursor); diethylamine (VX precursor)	HIGH
North Korea Tech	KOMID maritime shipments; Oman / UAE transshipment; OMM / Mirae Shipping	KOMID; OMM; Mirae Shipping; Handasieh subsidiaries	Acid-resistant infrastructure; industrial valves; reactor materials	HIGH

IV. FINANCIAL ARCHITECTURE: PROCUREMENT AND EVASION NETWORKS

The resilience of the SSRC procurement apparatus derived not from technical sophistication alone but from a deliberately layered financial architecture designed to separate the physical logistics of arms acquisition from the financial payment chains—exploiting jurisdictions with high commercial activity and low beneficial ownership transparency.

A. Primary Financial Nodes

- **Captagon narcotics revenue:** The Assad regime's mass production and export of Captagon amphetamines generated assessed billions in untraceable revenue, laundered via regional money service businesses (MSBs) to fund chemical and conventional procurement drives.
- **UAE-based front companies:** Pegasus General Trading and entities linked to Arash Sepehri exploited UAE's free zone commercial environment and trade finance infrastructure. UAE MSBs functioned as layering mechanisms separating Iranian and North Korean payments from European procurement.
- **Oman transshipment:** Utilized for maritime cargo coordination, providing a neutral jurisdiction for KOMID-linked shipping companies to conduct intermediate bill-of-lading substitution.
- **Handasieh subsidiary invoicing:** Legitimate-appearing procurement tenders issued by unsanctioned subsidiaries (Syronics, General Company for Cable Industry) obscured end-user identity from 13 source countries including Germany, France, and South Korea.
- **Apollo International Limited (India):** Documented 39 shipments of industrial parts and equipment to Handasieh-linked General Company for Iron and Steel Products—illustrating the global reach of the procurement network and the inadequacy of unilateral sanctions enforcement.

B. Residual Financial Risk (April 2026)

- US Treasury continues active targeting of Hezbollah's illicit financial networks, which launder tens of millions of dollars through exchange houses to fund paramilitary rebuilding.
- The same MSB infrastructure previously servicing SSRC procurement remains operationally intact and potentially available for reconstitution efforts by surviving SSRC technical cadre or regional state actors seeking to acquire Syrian chemical expertise.
- The OPCW and FATF frameworks must be applied in concert to trace and disable these residual networks.

V. FORENSIC ATTRIBUTION CAPABILITY: THE MOLECULAR FINGERPRINT

Any future chemical incident involving SSRC-produced material will bear definitive forensic markers, providing near-certain retroactive attribution regardless of the actor deploying the weapon. This constitutes both a deterrence factor and a critical intelligence collection tool.

SSRC Signature	Institute 3000 / Sarin Profile
Stabilizer	Hexamine (hexamethylenetetramine): unique to Syrian state synthesis; not used by USSR, US, or Iraqi programs.
Synthesis Byproduct	Diisopropyl methylphosphonate (DIMP): persistent environmental marker identifiable via GC-MS in soil, metal fragments, blood, urine, and hair.
Detection Matrix	Gas chromatography / mass spectrometry (GC-MS); concurrent presence of sarin + hexamine + DIMP = definitive Institute 3000 attribution.
Confirmed Use Cases	Ghouta (Aug 2013); Ltamenah (Mar 2017); Khan Sheikhoun (Apr 2017): all IIT/JIM attributed to Syrian government.
Investigative Mandate	OPCW Investigation and Identification Team (IIT); 'reasonable grounds' standard of proof; 5 reports issued 2020–2026.
Latest IIT Report	5th Report, January 2026: Kafr Zeita chlorine attack (2016) attributed to Syrian Arab Air Force; first report utilizing full transitional government cooperation.

VI. TRANSITIONAL GOVERNMENT AND INTERNATIONAL DISARMAMENT FRAMEWORK

The new Syrian transitional government under President Ahmed al-Sharaa (Abu Mohammad al-Julani) and Prime Minister Mohammed al-Bashir has fundamentally reoriented Syria’s relationship with the international nonproliferation architecture, providing cooperation unprecedented in the CWC era.

A. Key Milestones: 2025 to 2026

- **February 2025:** OPCW Director-General visited Damascus; face-to-face guarantees secured for unrestricted access to all military, scientific, and subterranean installations.
- **April 2025:** OPCW formally confirmed over 100 previously undeclared chemical weapons-related sites across Syrian territory—validating a decade of intelligence assessments.
- **January 2026:** Transitional government assistance proved decisive in finalizing IIT 5th Report attribution of Kafr Zeita attack.
- **March 2026:** Syria announced internationally-backed disarmament plan at the United Nations; joint task force established under OPCW supervision with US, UK, France, Germany, and Canada.
- **March 2026:** Syrian Army units raided and sealed Hezbollah subterranean smuggling tunnels in Hawsh al Sayyid Ali, Homs Province.

B. Ongoing Remediation Risk Factors

- **Site Security:** 100+ undeclared sites require sequential assessment, physical security, and remediation under OPCW supervision—a logistical challenge in a post-conflict environment with residual IS presence.
- **Environmental Contamination:** Kinetic damage from December 2024 IDF strikes on SSRC nodes created environmental contamination risk at Jamraya, Barzeh, and Masyaf sites. OPCW Executive Council raised formal concern during emergency session.
- **EOD Hazards:** Volatile binary precursor stockpiles in degraded subterranean facilities require specialized EOD handling. Casualty risk to task force personnel assessed as significant.
- **Insurgent Threats:** Residual insurgent threats in eastern Syria complicate perimeter security of confirmed chemical infrastructure sites.

C. Foresight Horizons: 2026–2028

HORIZON	SCENARIO	PROBABILITY
2026: Near	Hezbollah domestically synthesizes rudimentary chemical agent (e.g., chlorine-based) in Bekaa Valley to compensate for degraded conventional capability; IDF conducts preemptive strike based on intelligence indicators.	MEDIUM <i>Escalation</i>
2026: Near	OPCW task force identifies SSRC-grade sarin precursor at undeclared eastern Syria site; IS-linked individual apprehended attempting transfer across Iraqi border.	MED-HIGH <i>Accountability</i>
2027: Medium	French or Belgian court issues ruling on Brenntag/BASF dual-use export case; precedent forces EU-wide overhaul of CWC Schedule I/II export licensing regime.	HIGH <i>Systemic Reform</i>
2027: Medium	Surviving Branch 450 technical personnel identified in a third country; approached by state or non-state actor for CW program reconstitution advisory role.	MED-LOW <i>Intel Priority</i>
2028: Long	Syria achieves full OPCW-certified disarmament of declared legacy stockpiles; international sanctions partially lifted; Handasieh network residual entities attempt commercial rehabilitation.	MEDIUM <i>Monitoring Required</i>
2028: Long	OPCW IIT identifies chemical incident in conflict zone (non-Syria) bearing hexamine/DIMP signature; confirms dispersal of SSRC-produced material to non-state actor.	LOW-MED <i>Paradigm Shift</i>

VII. STRATEGIC CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

- The 2013 diplomatic disarmament framework failed comprehensively. The Assad regime used CWC accession as a tactical maneuver to weather international pressure while preserving the synthesis and weaponization apparatus through Branch 450 and undeclared Institute 3000 capacity. This precedent must inform all future negotiated WMD disarmament frameworks.
- Forensic chemical attribution—specifically the hexamine/DIMP molecular signature—proved to be the definitive countermeasure against state denial. The OPCW IIT’s ‘reasonable grounds’ standard, applied across five attribution reports, established durable legal and technical accountability despite diplomatic obstruction.
- The procurement network’s resilience confirms that sanctions without intelligence-driven end-user verification enable sophisticated state actors to continuously regenerate acquisition capacity. The Brenntag/MPI precedent is the clearest demonstration: 168 tonnes of sarin precursor transited European regulatory frameworks under pharmaceutical cover while OPCW inspectors operated inside Syria.
- The Israeli kinetic interdiction campaign (September 2024 Operation Many Ways; December 2024 350+ strikes) represents the de facto enforcement mechanism of last resort when diplomatic frameworks fail.
- The permanent elimination of the Syrian land-bridge has imposed a structural constraint on Hezbollah’s precision missile program that no diplomatic agreement achieved.

B. Priority Recommendations

- **Immediate:** Mandate OPCW biometric registration of all identified SSRC Branch 450 and Institute 3000 technical personnel to enable cross-border tracking and prevent knowledge transfer to state or non-state WMD programs.
- **Short-Term (2026):** EU member states should implement mandatory intelligence-sharing on CWC Schedule I/II export applications; establish an OPCW-Europol joint financial intelligence cell targeting dual-use procurement finance.
- **Medium-Term (2027):** US Treasury OFAC and EU listings should be expanded to cover surviving Handasieh subsidiary commercial entities and UAE/Oman MSBs previously documented in SSRC financial flows.
- **Sustained:** UNIFIL mandate should be formally expanded to include chemical cache monitoring in southern Lebanon in coordination with the Lebanese Armed Forces, utilizing OPCW technical advisory capacity.
- **Strategic:** The IIT hexamine/DIMP signature protocol should be codified as a mandatory detection standard for all UN-mandated investigation bodies examining chemical incidents in conflict zones globally.



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ABOUT CORE GROUP

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We are based in Beirut. In environments where official data is systematically unreliable and remote analysis inherits every distortion in its source material, physical proximity is not a logistical convenience but an epistemological foundation of our methodology. We verify what others can only estimate.

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