THE ELUSIVE "JUST ENOUGH"

Re-inventing Explosive Hazard Clearance Management in IRAQ

By Mark Wilkinson, Ph.D. [United Nations Mine Action Service]

The Government of Iraq viewed rehabilitation of infrastructure contaminated with explosives during the conflict with the Islamic State of Iraq and the Levant (ISIL) as a prerequisite to socioeconomic recovery and political stability, which, in turn, established a need for the mine action community to deploy qualified, certified clearance teams as quickly as possible. While these teams could deploy quickly, their reliance on international staff and their associated costs attributable to security and other factors introduced a *high overhead* business model that became an accepted standard during a first clearance phase from 2015 to 2019, despite the understanding that this model could not be sustained indefinitely. A shift in donor priorities and reduced budgets effectively introduced a second clearance phase beginning in 2020. The challenge to the mine action community became the development of a more cost-effective, time-sensitive approach to clearance so as to reduce costs to levels acceptable to donors without compromising clearance standards.

In response, the United Nations Mine Action Service (UNMAS) Iraq through its (1) evidence-based analysis and measurement of data and (2) effects-based approach to clearance delivery introduced a *low cost, high return* business model. This model offered a more efficient approach when compared to previous like-for-like models, in addition to providing useful tool sets applicable for other locations and conditions similar to those found in Iraq.

As of December 2017, west Mosul was heavily contaminated not only with explosive remnants of war (ERW) but also with what proved to be thousands of improvised explosive devices (IEDs) left by ISIL. These devices denied access to sites and infrastructure, thereby delaying the complicated task of render safe/removal efforts consistent with international standards.[1,2]

Phase 1: The Problem

The urgency and conditions that determined the need to deploy qualified, certified clearance teams quickly also de facto dictated the terms for what became the Phase 1 business model of clearance, lasting roughly from 2015 to 2019.

During Phase 1, UNMAS relied on international commercial companies (ICC) for explosive ordnance disposal (EOD) and improvised explosive device disposal (IEDD) expertise despite their relative high cost attributable (1) to their reliance on foreign experts; and, concomitantly, (2) to their need for protection provided by private security detachments.

Although costly, the model achieved the desired results. From 2016 to 2020, explosive hazard (EH) clearance teams under UNMAS-managed contracts performed 1,823 clearance tasks, rendering safe/removing 67,335 EH while clearing 10.6 million sq m of land and counting.[3]

Yet, at the end of 2019, an estimated 2,522 sq km in an area formerly occupied by ISIL remained contaminated (see Figure 1) while budgets available to support clearance began to decline, partly because donor priorities and strategies had changed. Nonetheless, for the Government of Iraq, rebuilding and rehabilitating infrastructure remained critical and depended upon EH clearance to proceed despite the ongoing risks posed by ISIL insurgents and related security costs (see Figure 2, ISIL Activity); and therein, lay the crux of the business problem entering Phase 2: do more with less.

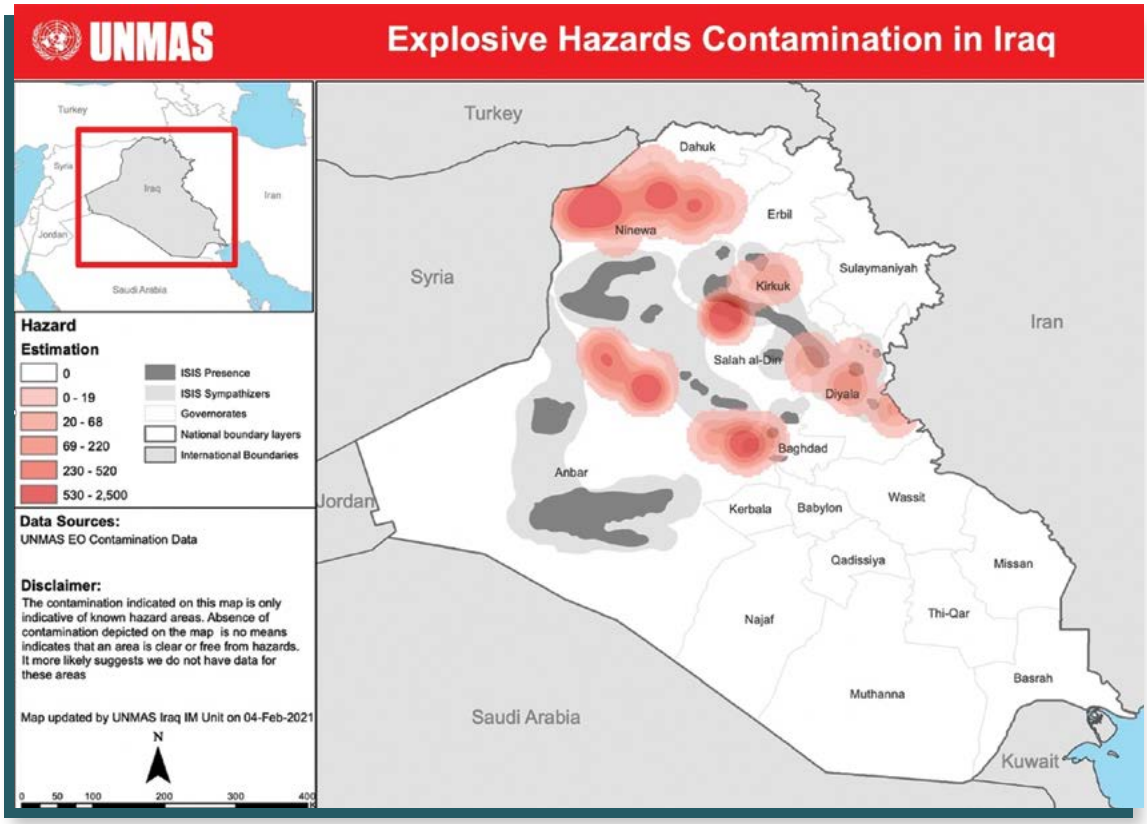

Figure 1. Explosive hazard contamination in Iraq, UNMAS Information Management Unit, 4 February 2021. *All graphics courtesy of UNMAS.*

Phase 1: The Factors

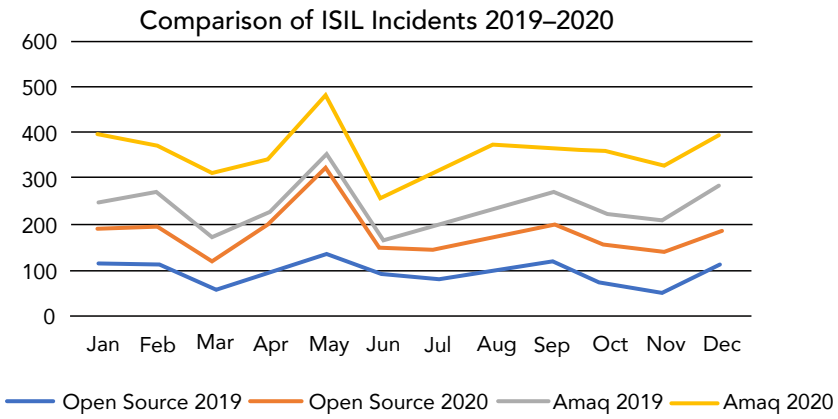

Figure 2. Comparison of open source and Amaq (ISIL News Agency) data as compiled by, and courtesy of Joint Analysis Unit (JAU), United Nations Assistance Mission for Iraq (UNAMI), 27 January 2021.

From the outset, UNMAS realized the high overhead model could not be sustained indefinitely, and several factors drove its change.

Security. UNMAS recognized that, effectively, it was managing a *hybrid* clearance situation: neither peacekeeping nor humanitarian due to the continuing security threats. After their retreat from Mosul in December 2017, ISIL's remaining fighters did not leave; they switched from conventional warfare to guerilla tactics in an effort to deny recovery and maintain de facto control in the one-third of Iraq they once occupied. Some disappeared literally underground, while others hid in plain sight among sympathizers, at times targeting clearance teams. According to UN security analysts, 2020 set a new record for ISIL incidents (Figure 2). This hybrid situation remains very much a concern and a factor for a *low cost, high return* model.

Time. Data analysis by UNMAS since December 2017 has shown time-on-task varies as a function of (1) events leading to contamination; (2) extent of contamination; (3) environment type; (4) exposure of operators based on the device and/or its design; (5) operators' experience, (i.e., skills and assets appropriate for clearance and safe removal of threats as assessed); and (6) events beyond operational control, (e.g., security and COVID-19 restrictions), which either disrupt or delay clearance operations.

Measurement. UNMAS reasoned that these factors when measured systematically[4] could provide an evidence-based estimate of relative *hazardousness* for contaminated areas with implications for time required for safe clearance, removal, and disposal of hazards

consistent with IMAS standards; and, importantly, for team composition, training, and deployment (i.e., assigning teams appropriately trained for each task). Accordingly, by mid-2019, UNMAS began development of what became a *lethality index*, which—for the first time—classified clearance tasks according to environment and technical factors (see **Time**), and assigned values for locations, thereby providing an evidence-based measurement of *lethality* with implications for skillset, time, and cost. The more lethal the task, and the longer the time required for render safe and removal, the greater the skills required and associated hourly cost.

Fit-for-purpose. At the same time, UNMAS began evaluating alternative team compositions and, by mid-2019, introduced on a trial basis a light version based on the decades-old, proven rapid response team (RRT) concept.[5] These highly-mobile, cost-effective teams relied exclusively on fully-trained Iraqi staff for high-risk search (HRS), EOD, IEDD, and geographic information systems (GIS) reporting, equipped with integral medical support, and deployable anywhere in the liberated areas of Iraq within a twenty-four-hour period. The RRTs were backed by a single, on-call international technical advisor who did not deploy. The RRTs relied on local security, eliminating the constraints and costs associated with predominately international staff and less mobile-heavy teams equipped with mechanical assets.

Repositioning. UNMAS positioned itself to (1) rewrite the way business was conducted through statements of work based on evidence-based data measuring time-on-task as a function of relative difficulty (the *lethality index*) and validated operational concepts (e.g., RRT teams) that could provide both flexibility in tune with changing requirements and tasks as received from the Directorate of Mine Action (DMA), Iraq's national mine action authority; and (2) deliver results meeting IMAS standards at reduced costs and a higher rate of return.

Expediency. If the new ideas being developed offered a potential low-cost, high-return business model, UNMAS also would need to change its statements of work, which initially focused on specific requirements for clearance teams and their capability rather than outcomes, thereby introducing an unintended bias into the process that favored ICCs largely for reason of expediency: Given that their accreditation, team composition, and readiness to deploy solved the urgency issue, ICCs became the only viable clearance solution in the short term.

Double jeopardy. As of 2018, this safe choice pattern began to repeat. New contracts nearly always specified size, capability, and scope that favored bidders with similar, previous experience. This generic, more-of-the-same approach de facto endorsed the ICC profile as a norm for clearance teams, negating nongovernmental organizations (NGO) cost advantages. Since virtually all ICC teams were dominated by large numbers of international personnel, their statements of work built in higher personnel and security costs as an accepted cost of doing business. NGOs accredited for clearance in Iraq could therefore find themselves responding to statements of work that assumed security costs based on an ICC model despite NGOs' reliance on less costly local staff as well as associated operational advantages, including a reduced security requirement, thereby negating their competitive advantage while adopting the ICC's disadvantages. This situation would not begin to change until late 2018 when UNMAS awarded its first commercial contract for EH clearance in Iraq to an NGO.

Phase 2: The Changes

Statements of Work. The experience of Phase 1 strongly suggested other changes were necessary including re-design of statements of work, the part of each contract that detailed the methodology for delivery of services using an *effects-based* approach toward delivery of services.[6] By 2019, UNMAS was developing evidence-based measurement useful in assessing time-on-task for appropriate skillsets (the *lethality index*) and adapting and testing an agile, flexible team concept (the RRTs) which, taken together, promised the *low-cost*, *high-return* model sought for a Phase 2.

Effects-based. This inherently fairer approach gave potential clearance partners more freedom and an opportunity to focus on outcomes rather than dictating means of delivery. Thereby, UNMAS not only achieved a desired outcome but also tested potential clearance partners' existing knowledge while encouraging a *just enough* approach to resources, thus promoting innovation and cost-effectiveness while meeting IMAS standards.

Accordingly, consistent with its evidence-based measurement and agile, flexible team concepts, future statements of work were framed using an effects-based approach to clearance delivery around the following parameters:

- **Intelligence analysis**. UNMAS includes an initial work package based on *lethality index* measurements to ensure that clearance partners base their proposals on a thorough and evidence-based assessment of the intended geographical area, the impact of the conflict there, its IED and EH threat characteristics, likely task types, and mobility/travel requirements.[7]
- Requirements. Clearance partners use environmental and technical factors[8] derived from UNMAS intelligence analysis as a guide to ensure adequacy of delivery proposals.
- **Capability.** Clearance partners demonstrate their capability to deliver the required clearance outcome(s) through a detailed analysis of tasks, and their working procedures and practices as meeting relevant national/international standards.
- **Enhancement.** Clearance partners include mentoring and development of both individual and team skills in a logical way such that teams can plan, deliver, and report effectively on the task types they have been trained to conduct: capacity enhancement is as important as clearance.
- **Risk management.** Clearance partners demonstrate a dynamic and proactive approach to risk management to predefined levels that are "as low as reasonably practicable."

Transition. By 2019, UNMAS Iraq had worked through details of a two-step approach as agreed with its procurement partners to transition to an effects-based approach and was ready with a first clearance contract, including a statement of work based on three parameters open to both ICCs and NGOs. Accordingly, UNMAS aimed to

- shorten the mobilization phase by providing precise environmental and technical information related to current and potential locations, thereby ensuring ICCs and NGOs could reflect this information in terms of proposed team composition and equipment as cost effectiveness/value for money;
- limit international staff and increase national staff levels and ownership, both of which are consistent with a commitment to mentoring and development of national resources along with cost reduction; and
- ensure proper oversight by linking the operational delivery to a pilot study using an UNMAS risk management tool set dating from contract signature onward, affording a visibility of risk so that UNMAS could comment and/or intervene constructively and developmentally to address concerns at any time.

This first step in the transition to full effects-based clearance activities was delivered with a contract for clearance in Ninewa that commenced in January 2020, followed by the second step in October 2020 when the new grant partnership model was signed and initiated. Statements of work for a two-year time frame included management, programs, operations, support, quality assurance, leadership, risk management, and resource mobilization as parameters in anticipation of fully-qualified, Iraqi-managed clearance capability sustained by international and national NGOs.

Phase 3: The Transition

Even as UNMAS was developing an evidence-based measurement tool useful in assessing time-on-task for appropriate skillsets (the *lethality index*) and adapting and testing an agile, flexible team concept that, taken together, promised the low-cost, high-return model sought in Phase 2, the experience of Phase 1 strongly suggested other changes were necessary. These included a transition in advance of an UNMAS exit to a stronger leadership role for DMA. During this transition, UNMAS saw itself moving into a consulting role, gradually transferring ownership of the day-to-day management of clearance tasks under contract. By mid-2019, UNMAS Iraq had introduced four management initiatives to guide those making decisions on both sides while managing the expectations of all, namely:

- **Partnership.** UNMAS would approach operational oversight and quality assurance on a cooperative basis, with an emphasis on coaching and mentoring delivery partners so as to build local capacity, confidence, and independence.
- **Sustainability.** Delivery partners should train initially with minimal direct international technical supervision so as to strengthen and sustain national capability to the point that it is self-sustaining and self-supervising.
- **Identity.** National capability should represent the ethnography of the areas it operates within, thus bolstering acceptance of clearance teams and their work.
- **Gender.** UNMAS and the DMA would share a leadership role to assure that all strategic, managerial, and operational decision-making, planning, and participation would reflect both women's and men's experiences, needs, and perspectives.

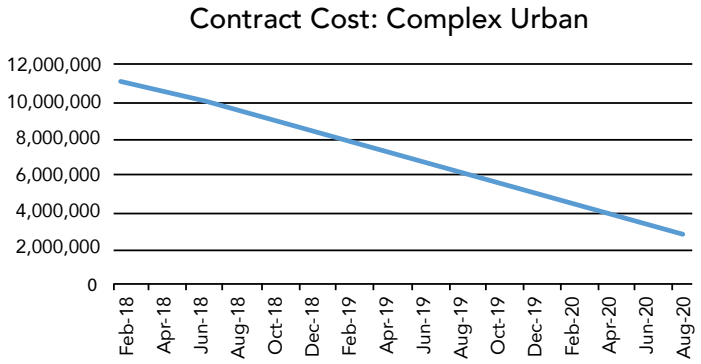

Figure 3.

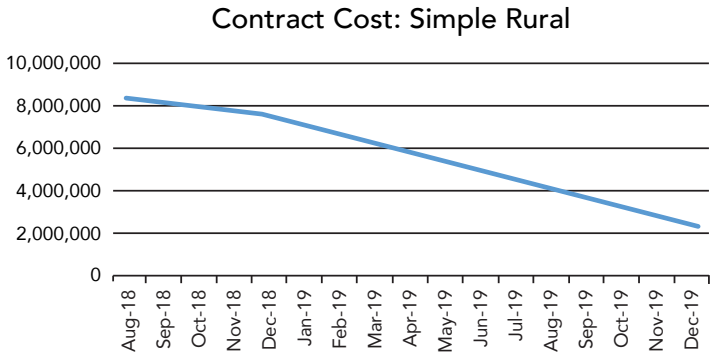

Figure 4.

	Cost $	Sq m	Environment	Type	Contractor
Jun-18	10,232,049	179,472	Urban	Complex	ICC 3 Mosul
Feb-18	11,156,652	164,188	Urban	Complex	ICC 1 Mosul
Aug-20	2,786,194		Urban	Complex	ICC 2 Mosul

Table 1.

	Cost $	Sq m	Environment	Type	Contractor
Dec-18	7,486,814	639,450	Rural	Simple	ICC 3 Sinjar
Aug-18	8,509,911	2,089,806	Rural	Simple	ICC 3 Kirkuk
Dec-19	2,548,636		Rural	Simple	ICC 2 Sinjar

Table 2.

Benefits

The benefits of an effects-based approach to clearance delivery are clear, beginning with the most important: a sustainable, fully-national, and non-profit clearance capability. Three additional benefits are worth noting:

- **Value for money.** A reduction in the contracted cost of *like-for-like* clearance contracts by a factor of five during a two-year period, largely as a result of reduced reliance on international personnel and related security requirements, while maintaining IMAS quality standards.
- **Ownership.** Locally-recruited teams generate both acceptance and sustainability, eliminate accommodation costs, and require only a locally-based office to sustain operations. Any required international staff can work remotely with travel limited to quality assurance, technical oversight, or training purposes until they are no longer required.
- **Redefined role.** Relationship with delivery partners is now based on a clear definition of pragmatic outcomes, when-needed support, and operational and quality oversight.

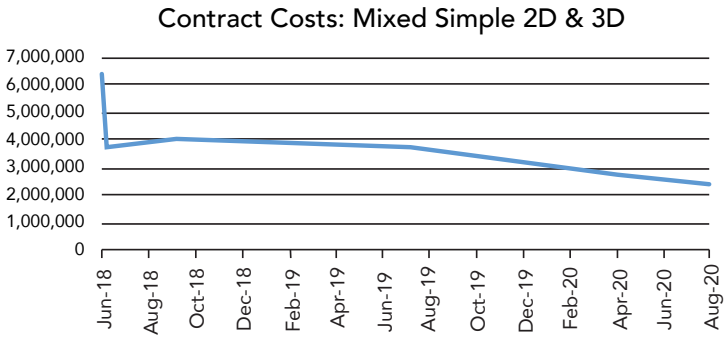

Figure 5.

	Cost $	*Sq m*	*Environment*	*Type*	*Contractor*
Jun-18	6,374,302	183,906	Mixed		ICC 1 RRT
Sep-18	3,996,182	111,235	Mixed		NGO 1 SAD
Jun-18	3,782,356	740,146	Mixed		NGO 2 Ninewa
Jul-19	3,691,709		Mixed		NGO 1 Anbar
Aug-20	2,343,195		Mixed		NGO 1 Fallujah

Table 3.

The Future of "Just Enough"

UNMAS Iraq through its (1) evidence-based analysis and measurement of data and (2) effects-based approach to clearance delivery offers a logical and coherent approach to planning, reduced cost, and performance gains when compared to previous like-for-like projects, and useful tool sets applicable for other locations as well. Most important, the timing of this low cost, high return model coincides with the on-going transfer of UNMAS Iraq's evolving role and transfer of remaining clearance activities and related management to DMA as part of a well-planned exit strategy.

BIOGRAPHY

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Mark Wilkinson, Ph.D., UNMAS (Iraq) Senior Operations Manager, has twenty years of professional experience in military and HMA. As a former British Army Ammunition Technical Officer, he worked as a High Threat IEDD Operator in several operational environments before transitioning to HMA. His HMA experience has developed through time spent as an IEDD operator, then a program manager, before moving to UNMAS. His academic background includes a master's degree in global security and a doctorate in politics and international studies. His thesis on Arms Control and Intelligence has been published internationally as the book *Before Intelligence Failed*. He is also a Visiting Fellow at the University of Nottingham Centre for Conflict, Security and Terrorism where he maintains an active research agenda.

ENDNOTES

The Elusive "Just Enough": Re-inventing Explosive Hazard Clearance Management in Iraq
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1. "IEDs and Urban Clearance Variables in Mosul: Defining Complex Environments," *The Journal of Conventional Weapons Destruction*, Vol. 23, Issue 2, pp. 13-20, July, 2019, https://bit.ly/3k8cbLs.
2. "IED Threat Consistency, Predictability Suggest a 'Simple' Model for Clearance," *The Journal of Conventional Weapons Destruction*, Vol. 23, Issue 2, pp. 7-12, July, 2019, https://bit.ly/3C7aMLf.
3. UNMAS data current as of June 7, 2021.
4. "The Lethality Index: Re-Conceptualizing IED Clearance Planning and Delivery in Iraq," *The Journal of Conventional Weapons Destruction*, Vol. 24, Issue 1, pp. 38-44, https://bit.ly/390izy9.
5. "Connecting the Dots: The Pace of IED Clearance Seen as Key Factor to Safe Return of 1.67 Million Displaced Iraqis," *Counter IED Report,* Autumn, 2019, pp. 17-22, https://bit.ly/3k5p1dm.
6. Author's note: The term "effects based operations" originated in a military context and is attributed to Lt General David A. Deptula, USAF (Ret), principal author of the first Gulf War air campaign. In generic terms, the concept effects-based operations emphasizes end-state goals first, and then focuses on the means available to achieve those goals, recognizing that these means can vary.
7. The Lethality Index: Re-Conceptualizing IED Clearance Planning and Delivery in Iraq," *The Journal of Conventional Weapons Destruction*, Vol. 24, Issue 1, pp. 38-44, https://bit.ly/2XjATQg.
8. *Ibid.,* pp. 38-40.