Geneva Water Hub

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Desalination Plants Under Fire in the Gulf Conflict: A legal Perspective

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1. Classification of the armed conflict

On 28 February 2026, the United States and Israel launched large-scale airstrikes on Iranian territory, targeting missile facilities, air defence systems and the Iranian leadership.[1] Iran subsequently responded with missile and drone attacks against United States military installations, Israeli territory, and targets located in several Gulf states, including Bahrain, Qatar, the United Arab Emirates, Kuwait, Jordan and Saudi Arabia.[2] The hostility between these three countries constitutes international armed conflict (IAC), pursuant to Common Article 2 of the Geneva Conventions, which arises whenever one or more States resort to armed force against another State, regardless of the reasons for or the intensity of the confrontation.[3] On this basis, the exchange of airstrikes, missile attacks and drone operations between Iran, the United States and Israel clearly satisfy the threshold for the existence of an IAC.

A further issue arises in relation to Iranian strikes against military bases located in neighbouring countries. Under prevailing interpretation of Common Article 2, any resort to armed force by one State against another State on its territory may trigger a separate IAC between those States. Iran conduct strikes on their territory, and available reports suggest that some attacks affected energy and water infrastructure beyond the military bases themselves.[4] Accordingly, Iran's operations within the territory of these Gulf States can be considered as triggering separate IACs. Note that a contrary argument could be made, i.e., as Iran specifically targeted United States military installations and armed forces rather than the territorial States, that would not necessarily trigger separate IACs with the host States.

2. Water desalination facilities enter the battlefield?

The escalation of hostilities in March 2026 between Iran, Israel and the United States has brought water desalination plants into the dynamics of the conflict. During the latest round of strikes, it is reported that a United States attack damaged a desalination facility on Qeshm Island, disrupting water supplies to 30 villages in southern Iran.[5] Iran's Foreign Minister, Abbas Araghchi, accused the US of targeting a freshwater desalination plant and warned that the strike would set a dangerous 'precedent'.[6] Shortly thereafter, it was reported that an Iranian drone strike damaged a desalination plant in Muharraq, Bahrain, injuring civilians and raising concerns across the Gulf region about the vulnerability of civilian infrastructure.[7] The attacks have raised concern among various actors, including the World Water Council, which has called on all parties to fully comply with their obligations under international law.[8]

Water desalination facilities are objects indispensable to the survival of the civilian population. The sequence of events has raised fears that desalination plants may become a weapon of warfare. This raises an important legal question under international humanitarian law (IHL), i.e., can desalination plant become a lawful target and subject to reprisals? The question is particularly acute in this region as damage to such facilities, whether through direct attack or incidental damage, have immediate and far-reaching humanitarian consequences. Given their critical importance for civilian populations, parties to the conflict must recognize these risks, avoid escalation and refrain from weaponizing such facilities.

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[1] Melimopoulos, E., 'Iran war: What is happening on day 12 of US-Israel attacks?' Al Jazeera, 11 March 2026.

[2] Institute for the Study of War (ISW), 'Iran update special report: US and Israeli strikes', 28 February 2026.

[3] See Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field. Geneva, 12 August 1949, Article 2.

[4] See Aliyeva, E., *et al.*, 'Iran's strikes on Gulf energy sites rattle markets and raise recession fears', *Euronews*, 6 March 2026; and 'The critical infrastructure that's so vital to Middle East nations – and vulnerable to Iranian attack', *The Independent*, 10 March 2026.

[5] Nereim, V., 'Vital Desalination Plants in Iran and Bahrain Are Attacked', *The New York Times*, 8 March 2026.

[6] Araghchi, S. A. [@araghchi], 'The U.S. committed a blatant and desperate crime by attacking a freshwater desalination plant on Qeshm… [Post]'. X., 9 March 2026.

[7] AFP and Reuters, 'Bahrain says water desalination plant damaged in Iranian drone attack', 8 March 2026.

[8] 'Middle East conflict: World Water Council condemns attacks on water facilities, reiterates obligations under international law', 10 March 2026.

The incidents observed in March 2026 illustrate the growing risk that water infrastructure could become entangled in armed conflicts. Research on the weaponization of water demonstrates that water systems have increasingly been used as tools of warfare in contemporary conflicts.[9] Such practices have devastating humanitarian and environmental consequences, particularly in regions already facing severe water scarcity. Moreover, the risk of escalation in attacks on desalination facilities also raises broader concerns regarding the potential targeting of other forms of critical civilian infrastructure in the region. IHL provides a framework designed precisely to prevent such outcomes. Respect for these rules is essential to prevent the normalization of attacks on water systems.

3. Strategic importance of desalination plants in the region

The legal implications of attacks on desalination infrastructure cannot be understood without considering the vulnerability of the region facing dire water scarcity with less than 2% of the world's renewable freshwater, and home to 6% of the world's population.[10] Desalination has become the main provision of potable water for the populations, agriculture, industry and healthcare. Roughly 100 million people in the region depend for their water on desalination plants.[11] The Gulf Cooperation Council countries accounts for approximately 60 percent of global desalination capacity, operating over 400 plants that together produce around 40 percent of the world's desalinated water. This rapid growth in desalination capacity has enabled the countries in the region to address their water scarcity challenges better, providing a more reliable and sustainable water supply for the population which significantly contributed to bringing the region closer to achieving the SDG 6.[12]

Dependence on desalinated supply varies but is substantial across the countries in the region. For certain nations, this dependence is near-total Kuwait and Oman source 90 and 86 percent of their drinking water from desalination respectively, Saudi Arabia approximately 70 percent, and the United Arab Emirates around 42 percent, while Bahrain and Qatar obtain nearly all of their drinking water from desalinated sources.[13] Beyond the Gulf, Israel follows a comparable model, with five large coastal plants supplying roughly 70% of its potable water needs, and Iran too has come to rely increasingly on desalination to supply coastal communities. In all these states, an attack on a major desalination plant is, functionally, an attack on the population's ability to survive.

It is worth noting that desalination plants sit at the intersection of multiple critical systems. They are energy-intensive, typically consuming large amounts of electricity - linking them inextricably to the power grid. Many rely on chemical inputs such as chlorine and anti-scalants that must be imported or transported. They feed into downstream distribution networks, hospitals, agricultural irrigation systems, and industrial cooling operations.[14]

This interconnectedness means that disrupting a desalination plant has direct and reverberating effects far beyond the facility itself.[15] Damage to one component of this system not only directly deprive civilian of safe water for personal and domestic uses, but also can trigger cascading failures across others, whereby damage extends far beyond the immediate point of impact and may severely disrupt essential services for civilian

[9] Boudon, R. J., Sangster, S., & Shree, G., Water weaponization: Dominant trends and local action to spare water from armed conflict in Syria, Palestine and Yemen, *Applied Research Project No.59*, 2025.

[10] Khanzada, N.K., *et al.,* 'Desalination and the Middle East: research, practices, implications, and prospects', *npj Clean Water* 9, 21 (2026). https://doi.org/10.1038/s41545-026-00554-x

[11] Chibani, A., 'The Costs and Benefits of Water Desalination in the Gulf', 12 April 2023, https://arabcenterdc.org/resource/the-costs-and-benefits-of-water-desalination-in-the-gulf/

[12] Khanzada, N.K., *et al.,* n.10, p.2.

[13] Jones, E., *et al.*, 'The state of desalination and brine production: A global outlook', *Science of The Total Environment*, 657 (2019), 1343–1356.

[14] Voutchkov, N., *Desalination Engineering: Operation and Maintenance*. New York: McGraw-Hill Education, 2014.

[15] Geneva Water Hub, 'Understanding reverberating effects', Geneva Water Hub 2025.

populations.[16] Large desalination plants frequently serve major coastal cities and may supply hundreds of thousands, or even millions, of people. Because urban water systems are highly interconnected, interruptions in supply can trigger cascading failures across essential services. For example, a major plant serving a coastal city may support several hundred thousand people. If the water supply is interrupted for days or weeks, hospitals face crisis-level shortages, food production falters, and social order can rapidly deteriorate. It is precisely such ripple effects that make compliance with the legal protection particularly significant.

4. Legal framework governing attacks against desalination plants

The conduct of hostilities in the ongoing armed conflict between the United States, Israel and Iran is governed by IHL, including both treaty obligations and customary rules. The three states are not party to Additional Protocol (AP I), and hence not bound by it as a treaty law.[17] Nevertheless, many of the AP I's core rules are widely recognised as reflecting customary IHL and therefore apply to all parties to the conflict.

Hence, they must respect the principles of distinction, proportionality and precautions (both active and passive). As per the principle of distinction, water desalination plants benefit from the protection accorded to civilian objects and, hence, must be spared from attacks.[18] They also benefit from a presumption of civilian status. It further entails the prohibition of indiscriminate attacks (those not directed at a specific military objective, or employ a method or means of combat which cannot be directed at a specific military objective or which cannot be limited as required by IHL).[19] This means that parties must not only directly target water desalination plants, but also ensure that their attacks are specifically directed towards identified military objectives.[20] These prohibitions are also restated in the Geneva List of Principles on the Protection of Water Infrastructure.[21]

Even when civilian objects become military objectives, the principles of proportionality and precautions must be respected. Proportionality in attack prohibits launching an attack which may be expected to cause incidental loss or damage which would be excessive in relation to the concrete and direct military advantage anticipated ('collateral damage').[22] The assessment of the incidental damage is generally understood to include reverberating or indirect impacts that are foreseeable in the circumstances at the time of the attack.[23] Such 'incidental losses and damages should never be extensive'.[24]

Precautions in attack demand that in the conduct of *military operations,* constant care shall be taken to spare the civilians and civilian objects and to take all feasible precautions to avoid and, in any event, to minimise incidental losses and damages.[25] In addition, parties to the conflict must take 'passive precautions', including avoiding locating military objectives 'within or near densely populated areas'.[26] The Geneva Principles include

[16] See Zeitoun, M., and Talhami, M., 'The Impact of Explosive Weapons on Urban Services: Direct and Reverberating Effects across Space and Time', *International Review of the Red Cross,* 98 (1), 2016; and ICRC, *Urban Services during Protracted Armed Conflict: A Call for a Better Approach to Assisting Affected People*, Geneva, 2015.

[17] The United States and Iran are *signatory* States to Additional Protocol I, thus must note defeat the object and purpose of the treaty. Under Article 18 of the Vienna Convention on the Law of Treaties (1969), a State that has signed but not ratified a treaty remains subject to a limited legal obligation to refrain from acts that would defeat the object and purpose of the treaty, unless it has made clear its intention not to become a party.

[18] ICRC, Customary International Humanitarian Law Database (CIHL), Rule 7.

[19] Ibid, CIHL, Rule 11 and Rule 12.

[20] Ibid, CIHL, Rule 8.

[21] Geneva Water Hub, *The Geneva list of principles on the protection of water infrastructure*, 2019, see Principles 6 and 8.

[22] ICRC, CHIL, Rule 14.

[23] See Kaelin D, Pellaton C, Kebebew T., 'Water and survival in war: Upholding IHL's protective purpose and documenting the hidden toll', *International Review of the Red Cross*, 107(930), 2025, 1141-1168.

[24] See Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts, 8 June 1977, Additional Protocol I, commentary, para.1980.

[25] ICRC, CIHL, Rules 15-21.

[26] ICRC, CIHL, Rules 22-24.

some recommendations in the context of passive precautions, such as the encouragement to establish protected areas around water and water-related infrastructure.[27]The Political Declaration on Strengthening the Protection of Civilians from the Humanitarian Consequences arising from the use of Explosive Weapons in Populated Areas also calls for avoiding or minimizing the direct and foreseeable indirect harm to the civilian population.[28]

Evaluating whether an attack constitutes a breach of these rules requires a nuanced analysis of multiple legal factors and factual elements.[29] This determination necessitates *an ex-ante* evaluation by the attacking party, based on available intelligence and information, as well as the manner in which the attack was planned.

In addition to the general protection under the conduct of hostilities rules, water desalination plants benefit from specific protections, particularly the protection for objects indispensable for the survival of the civilian population. The protection of such objects is fundamental to respect for the human person and to 'elementary considerations of humanity,' and should be regarded as one of the intransgressible principles of customary IHL.[30]In water-scarce environments where desalinated water constitutes the primary source of potable water, and their destruction deprives civilians of essential resources necessary for survival. Hence, such facilities fall squarely within this category and receive an additional layer of protection. IHL also prohibits the use of starvation of the civilian population as a method of warfare.[31] Water desalination plants can also potentially benefit from the protection given to the natural environment,[32] as damage to these facilities could cause significant environmental harm through the release of desalination chemicals or highly concentrated brine discharge.

Compliance with IHL by parties to a conflict would help prevent extensive destruction of civilian objects and harm to the civilian population.[33] It is also essential to recognize that extensive destruction of objects and harm to civilians can exacerbate animosity and perpetuate a cycle of violence and violations, hindering the prospects for peace.[34]

5. Reprisals and the limits of retaliatory actions

The obligation to respect and ensure respect for IHL does not depend on reciprocity, a party must respect it even if the adversary does not do so.[35] This foundational principle, rooted in Common Article 1 of the 1949 Geneva Conventions and affirmed as customary international law.[36] Violations by one party do not license reciprocal breaches by another, especially concerning protections for civilians and essential civilian objects.

Historically, reprisals were understood as otherwise unlawful acts undertaken in response to prior violations of international law, with the aim of inducing an adversary to comply with its legal obligations. They were viewed as an enforcement mechanism when other means of securing compliance were unavailable. Even then, reprisals remain subject to strict conditions: they must respond to a prior violation, be intended to

[27] Geneva List, n.21, Principle 11.

[28] See Political Declaration on Strengthening the Protection of Civilians from the Humanitarian Consequences arising from the use of Explosive Weapons in Populated Areas, 2022.

[29] See e.g., Sassòli, M., Assessing the conduct of hostilities in Gaza – Difficulties and possible solutions. Lieber Institute for Law and Warfare, 30 October 2023.

[30] ICRC, CIHL, Rule 54.

[31] ICRC, CIHL, Rule 53.

[32] ICRC, CIHL, Rules 45.

[33] See e.g., Organization for Security and Co-operation in Europe (OSCE), Report on violations of international humanitarian and human rights law, war crimes and crimes against humanity committed in Ukraine since 24 February 2022. OSCE Moscow Mechanism Mission of Experts, 2022, p.93.

[34] See e.g., Sassòli, M., n.29.

[35] ICRC, CIHL, Rule 140.

[36] See Common Article 1 to the Four Geneva Conventions of 1949; and ICRC, CIHL Rule 139.

induce compliance (not mere punishment), be proportionate to the initial violation, and be undertaken only as a measure of last resort after prior warning.[37]

Modern IHL has progressively restricted the scope of permissible reprisals, particularly where civilian populations or essential civilian infrastructure are concerned. AP I explicitly prohibits reprisals against objects indispensable to the survival of the civilian population, including drinking water installations and supplies.[38] In scenarios where none of the parties to the conflict are parties to AP I, it is necessary to examine the prohibition under customary IHL. As mentioned earlier, the prohibition on attacking, destroying, removing, or rendering useless objects indispensable to the survival of the civilian population is widely accepted as customary. However, unlike the prohibition on attacks themselves, the specific prohibition on reprisals against such objects has not yet fully crystallized in customary IHL. The commentary to the rule indicates that 'limited and ambiguous contrary practice' makes it difficult to conclude that a categorical customary prohibition has fully crystallized.[39]

Even where reprisals remain theoretically permissible under certain interpretations of customary law, they are subject to the aforementioned strict conditions. Thus, retaliatory attacks on desalination plant would face considerable legal obstacles. In the Gulf region, States rely heavily on desalination to meet the majority of their potable water needs, and the disruption or destruction of desalination infrastructure could rapidly deprive millions of civilians of access to drinking water. The foreseeable humanitarian consequences of disabling such infrastructure would therefore be difficult to reconcile with the broader purpose of IHL.

6. The obligation to ensure respect for IHL

The obligation to ensure respect for IHL under all circumstances,[40] is an established norm that extends beyond the immediate parties to a conflict.[41] Third states are tasked with preventing breaches of IHL, promoting compliance, and avoiding actions that might facilitate violations, such as arms transfers. It imposes both a negative and a positive obligation.[42] In its Advisory Opinion on the Wall, the International Court of Justice reinforces that third states are responsible for exerting pressure on conflict parties to uphold humanitarian standards.[43] Likewise, the International Criminal Tribunal for the former Yugoslavia in the *Kupreskic et al. case* highlights that IHL endows the international community a 'legal entitlement to demand respect for such obligations'.[44]

All High-Contracting Parties must ensure accountability for serious violations of IHL. Third states also have 'the right to vest universal jurisdiction in their national courts over war crimes',[45] i.e., to investigate alleged war crimes and, if warranted, prosecute the suspects. Serious violations relating to water, and indiscriminate or disproportionate attacks on water systems, may be prosecuted as war crimes.

When it comes to the possibility of individual criminal responsibility, neither the US, Israel nor Iran are parties to the Rome Statute of the International Criminal Court (ICC). As a result, the ICC would not normally have jurisdiction over crimes committed by their nationals or on their territories. There is a remote possibility that jurisdiction could arise through other mechanisms, including a referral by the United Nations Security Council or if crimes were committed on the territory of a State Party to the Rome Statute.

[37] See International Law Commission, *Responsibility of States for Internationally Wrongful Acts* 2001, ASR, Article 52.
[38] Additional Protocol I, Article 54(4).
[39] ICRC, CIHL Rule 147.
[40] ICRC, CIHL, Rule 144.
[41] See Longobardo, M., 'Alleged Violations of the Duty to Ensure Respect for IHL and the Monetary Gold Principle', 11 March 2024.
[42] Common Article 1, commentary to GC IV, para.189.
[43] ICJ, Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory, Advisory Opinion, 9 July 2004, paras 158-159.
[44] ICTY, *Prosecutor v Kupreskic et al. Case*, IT-95-16-T, 14 January 2000, para.519.
[45] ICRC, CIHL, Rule 157.

7. Other branches of international law

The protection of desalination infrastructure in armed conflict is reinforced not only by IHL but also by other branches of international law, including international human rights law and environmental law. Access to water is a human right and essential for the realization of all other human rights.[46] It is a prerequisite for realizing other human rights, including the right to a clean, healthy, and sustainable environment.[47] The UN Committee on Economic, Social and Cultural Rights has long established that the State party's obligations apply to all territories and populations under its effective control'.[48] Furthermore, states have a positive obligation to cooperate in the protection and fulfilment of human rights both within and beyond their borders. Thus, parties to the conflict must remain committed to such obligation while conducting their military operations. They must refrain from limiting or destroying water desalination plants as a punitive measure during armed conflicts.[49] The fundamental nature of these rights and the scale and severity of the impacts of their violations with long-term consequences for the survival and dignity of civilians, elevate these acts to serious human rights violations.

The PERAC Principles enshrine a mixture of rules and principles relying on various branches of international law as well as based on the practice of states and non-state actors, to enhance 'the protection of the environment in relation to armed conflicts, including through measures to prevent, mitigate and remediate harm to the environment.[50] It emphasizes that the protection of the environment is also linked with the protection of water resources and marine ecosystems. The Principles are relevant as water desalination plants depend on and interact with marine ecosystem and whose damage may result in environmental harm.

At the level of the United Nations, the UNSC recognizes the interconnectedness of certain essential services and condemns, among others, unlawful attacks against and misuse of objects indispensable to the civilian population, including those services that are key for the provision of water supplies.[51] Similarly, a unanimously adopted resolution S/RES/2417 (2018) underscores the link between armed conflict and conflict-induced food insecurity and addresses the protection of water and water systems.[52]

8. The logic of restraint

Retaliatory escalation against critical civilian infrastructure risks triggering severe humanitarian consequences and a dangerous cycle of reciprocal attacks. Once water infrastructure becomes normalized as a military target, the same vulnerability extends to all parties to the conflict. IHL seeks precisely to prevent such dynamics by restricting attacks on objects essential to civilian survival. These restrictions therefore reflect not only humanitarian considerations but also a broader strategic logic aimed at limiting escalation and protecting critical civilian infrastructure.

By maintaining protections for civilian objects and objects indispensable to civilian survival regardless of the adversary's conduct, the law preserves a minimum threshold of civilian protection even in situations of escalating hostilities. Adherence to these rules is therefore not only a legal obligation but also a strategic necessity. Interpreting the law in a way that would justify retaliatory attacks on desalination infrastructure risks undermining the humanitarian purpose of IHL and accelerating escalation. The desalination

[46] UN Committee on Economic, Social and Cultural Rights (CESCR), 'General comment no. 15 (2002), The right to water (arts. 11 and 12 of the International Covenant on Economic, Social and Cultural Rights', 2002, General Comment No. 15, para.1.

[47] UNGA, The human right to a clean, healthy and sustainable environment, 2022, A/76/L.75.

[48] CESCR, E/C.12/1/Add.90. para.31.

[49] See General Comment No. 15, paras.21 and 31.

[50] International Law Commission, *Draft principles on protection of the environment in relation to armed conflicts, with commentaries*, A/77/10, (PERAC Principles), 2022, Principle 2.

[51] UNSC, S/RES/2573 (2021).

[52] UNSC, S/RES/2417 (2018).

infrastructure are indispensable for the civilian population across the Gulf region, therefore, must benefit from the special protection under IHL.

Conclusion

In light of the foregoing, the protection of water desalination infrastructure and all other aspects of drinking water systems and sewage systems should remain a priority in the conduct of hostilities. Given their indispensable role in sustaining civilian populations, attacks on such facilities raise serious concerns under IHL and risk severe humanitarian and environmental consequences.

All parties to armed conflicts must therefore respect and ensure compliance with the applicable rules of IHL, including the protection afforded to objects indispensable to the survival of the civilian population.