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Examining the Scope of Nuclear Weapons-Related Activities Covered under the Environmental Remediation Obligation of the Treaty on the Prohibition of Nuclear Weapons

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Abstract

The entry into force of the Treaty on the Prohibition of Nuclear Weapons (TPNW) in January 2021 has sparked much discussion of the Treaty's positive obligations under Article 6. But while victim assistance under Article 6(1) has received considerable attention, the environmental remediation obligation within Article 6(2) remains underexplored. Filling this gap, this article examines a specific issue relating to environmental remediation under Article 6(2): the scope of nuclear weapons-related activities captured by the obligation imposed upon TPNW parties. Ultimately, it is revealed that significant ambiguity exists as to the scope of activities covered when applying the rules of treaty interpretation of the 1969 Vienna Convention on the Law of Treaties. After offering some policy arguments both for and against a broad interpretation, this paper recommends that TPNW parties should begin to advance and clarify their positions on this issue in order to clearly identify the scope of Article 6(2).

Keywords: nuclear weapons; TPNW; disarmament law; positive obligations; environmental remediation; humanitarian disarmament

The entry into force of the Treaty on the Prohibition of Nuclear Weapons (TPNW)¹ on 22 January 2021 constituted the latest milestone for the “Humanitarian Initiative” to abolish nuclear weapons, led by the 2017 Nobel Peace Prize winning civil society group, the International Campaign to Abolish Nuclear Weapons (ICAN), in conjunction with interested non-nuclear weapon states.² The TPNW establishes what Chiam and Hood have described as “the most comprehensive range of restrictions on nuclear weapons in history” within its Article 1 prohibitions,³ requiring states to never, under any circumstances, use, test, develop, produce, acquire, possess, stockpile, or station nuclear

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¹ *Treaty on the Prohibition of Nuclear Weapons*, 7 July 2017, GA Res. 71/258, UN Doc. A/CONF.229/2017/8 (entered into force 22 January 2021) [TPNW].

² “ICAN Receives 2017 Nobel Peace Prize” *International Campaign to Abolish Nuclear Weapons* (ICAN) (22 December 2017), online: ICAN <https://www.icanw.org/ican_receives_2017_nobel_peace_prize>.

³ Madelaine CHIAM and Anna HOOD, “Nuclear Humanitarianism” (2019) 24 *Journal of Conflict and Security Law* 473 at 474.

weapons,⁴ and not to assist any other actor to engage in such prohibited activities.⁵ Quite simply, the TPNW constitutes the first globally reaching multilateral agreement designed to comprehensively prohibit all aspects of nuclear weapons, while ultimately seeking to contribute towards their full elimination.⁶

However, precisely what impact the TPNW may have in facilitating progress towards nuclear disarmament remains to be seen. While supporters have described the TPNW as a “generational event of significance”⁷ and a “welcome addition to the nuclear non-proliferation and disarmament regime”⁸ that “marks a watershed given the slow progress and frustrations that had characterized nuclear disarmament for so many years”,⁹ opponents, principally the nuclear weapon possessing states (NWPS), their military allies, and sceptical commentators have criticized the Treaty as both conceptually flawed and “idealistic”.¹⁰ Indeed, on the day of the TPNW’s adoption in July 2017, the US, the UK, and France announced that they “do not intend to sign, ratify or ever become party” to the Treaty.¹¹ Russia and China later supported a similar joint statement released in October 2018.¹² Thus, while the TPNW has been ratified by sixty-six states as of 30 June 2022,¹³ this does not include any of the nine NWPS, nor any of the so-called nuclear umbrella states.

Yet this opposition has not dampened the spirits of TPNW supporters. On the contrary, the TPNW and the recent first meeting of states parties (1MSP) held in Vienna, Austria,

⁴ TPNW, *supra* note 1, art. 1(1)(a)-(g).

⁵ *Ibid.*, art. 1(1)(e).

⁶ *Ibid.*, art. 4 and preambular paragraph 2, which reads:

Deeply concerned about the catastrophic humanitarian consequences that would result from any use of nuclear weapons, and recognizing the consequent need to completely eliminate such weapons, which remains the only way to guarantee that nuclear weapons are never used again under any circumstances.

⁷ Daniel H. JOYNER, “The Treaty on the Prohibition of Nuclear Weapons” *EJIL: Talk!* (26 July 2017), online: EJIL: Talk! <<https://www.ejiltalk.org/the-treaty-on-the-prohibition-of-nuclear-weapons/>>. See also Daniel RIETIKER, “The Treaty on the Prohibition of Nuclear Weapons: A Further Confirmation of the Human and Victim-Centred Trend in Arms Control Law” in Jonathan L BLACK-BRANCH and Dieter FLECK, eds., *Nuclear Non-Proliferation in International Law – Volume IV: Human Perspectives on the Development and Use of Nuclear Energy* (The Hague: T.M.C. Asser Press, 2019), 325 at 326.

⁸ Gro NYSTEUN, Kjølv EGELAND, and Torbjørn GRAFF HUGO, “The TPNW: Setting the Record Straight” (October 2018) *Norwegian Academy of International Law* at 1.

⁹ *General Debate on All Disarmament and International Security Agenda Items of the First Committee*, 72nd Session of the United Nations General Assembly (UNGA), Statement by Tijjani MUHAMMAD-BANDE, Ambassador of Nigeria to the United Nations on behalf of the African Group (2017), online: Reaching Critical Will <https://reachingcriticalwill.org/images/documents/Disarmament-fora/1com/1com17/statements/20Oct_AfricanGroup.pdf> at 3–4.

¹⁰ See, generally, Christopher A. FORD (Assistant Secretary, Bureau of International Security and Nonproliferation), “The Treaty on the Prohibition of Nuclear Weapons: A Well-Intentioned Mistake” *Bureau of International Security and Nonproliferation* (30 October 2018), online: U.S. Department of State Archives <<https://2017-2021.state.gov/remarks-and-releases-bureau-of-international-security-and-nonproliferation/the-treaty-on-the-prohibition-of-nuclear-weapons-a-well-intentioned-mistake/index.html>>; Newell HIGHSMITH and Mallory STEWART, “The Nuclear Ban Treaty: A Legal Analysis” (2018) 60 *Survival: Global Politics and Strategy* 129.

¹¹ United States Mission to the United Nations (USUN), “Joint Press Statement from the Permanent Representatives to the United Nations of the United States, United Kingdom, and France Following the Adoption” *USUN* (7 July 2017), online: USUN <<https://usun.usmission.gov/joint-press-statement-from-the-permanent-representatives-to-the-united-nations-of-the-united-states-united-kingdom-and-france-following-the-adoption/>>.

¹² United Kingdom Mission to the United Nations in New York, United Kingdom Mission to the WTO, UN, and Other International Organizations (Geneva), “P5 Joint Statement on the Treaty on the Non-Proliferation of Nuclear Weapons” *GOV.UK* (24 October 2018), online: GOV.UK <<https://www.gov.uk/government/news/p5-joint-statement-on-the-treaty-on-the-non-proliferation-of-nuclear-weapons>>.

¹³ See “Status of the Treaty on the Prohibition of Nuclear Weapons”, online: United Nations Treaty Collection <https://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXVI-9&chapter=26>.

between 21–23 June 2022,¹⁴ marks the beginning of efforts by states parties, civil society, and other supporting organizations to operationalize the provisions of the TPNW. Of particular interest has been the so-called “positive obligations” of the TPNW contained within Article 6, which requires states parties to take affirmative action to address prior harm and damage caused by nuclear weapons testing and use, to both affected individuals and the environment.¹⁵ Importantly, because Article 6 imposes primary responsibility upon “affected” states parties to engage in measures to address past harm by the testing and use of nuclear weapons rather than the states that had used or tested nuclear weapons, the positive obligations are of immediate practical relevance regardless of whether the nuclear weapon possessing states accede to the TPNW or not.¹⁶ Accordingly, while none of the NWPS are yet to ratify the TPNW, the fact that states such as Kazakhstan and Kiribati – each of which have suffered from past nuclear testing during the twentieth century – are party to the Treaty, which indicates that Article 6 as a whole can address the legacy of such past testing. In this sense, the TPNW can go beyond its underlying normative, stigmatizing objectives,¹⁷ and have an observable impact and relevance in practice by alleviating past suffering to victims and the environment through the operationalization of Article 6.

However, while Article 6(1), which addresses victim assistance, has received a significant amount of scholarly attention so far,¹⁸ Article 6(2) on environmental remediation remains comparatively underexplored.¹⁹ Accordingly, and with a desire to contribute to our understanding of this obligation, this article seeks to assess a particular aspect of the environmental remediation provision under Article 6(2) of the TPNW; specifically what activities are covered under the phrase “activities related to the testing or use of nuclear weapons”. In full, Article 6(2) reads:

¹⁴ “Overview”, online: United Nations – UNODA Meetings Place <<https://meetings.unoda.org/meeting/tpnw-msp-1-2022/>>.

¹⁵ TPNW, *supra* note 1, art. 6.

¹⁶ International Human Rights Clinic (IHRC), “Victim Assistance and Environmental Remediation in the Treaty on the Prohibition of Nuclear Weapons: Myths and Realities” *Human Rights Programme - Harvard* (April 2019), online: Harvard Law School <https://hrp.law.harvard.edu/wp-content/uploads/2019/05/TPNW_Myths_Realities_April2019.pdf> at 8.

¹⁷ This stigmatising agenda is examined elsewhere, see Beatrice FIHN, “The Logic of Banning Nuclear Weapons” (2017) 59 *Survival: Global Politics and Strategy* 43; Tom SAUER and Mathias REVERAERT, “The Potential Stigmatizing Effect of the Treaty on the Prohibition of Nuclear Weapons” (2018) 25 *The Nonproliferation Review* 437; Clea STRYDOM, “Stigmatisation as a Road to Denuclearisation – The Stigmatising Effect of the TPNW” in Jonathan L. BLACK-BRANCH and Dieter FLECK, eds., *Nuclear Non-Proliferation in International Law - Volume VI: Nuclear Disarmament and Security at Risk - Legal Challenges in a Shifting Nuclear World* (The Hague: T.M.C. Asser Press, 2021), 453.

¹⁸ See e.g. Nidhi SINGH, “Victim Assistance under the Treaty on the Prohibition of Nuclear Weapons: An Analysis” (2020) 3 *Journal for Peace and Nuclear Disarmament* 265; Bonnie DOCHERTY, “A Singular Opportunity: Setting Standards for Victim Assistance under the Treaty on the Prohibition of Nuclear Weapons” (2021) 12 *Global Policy* 126; Emily CAMINS, “Addressing Victim Suffering Under Disarmament Law: Rights, Reparations and Humanising Trends in International Law” in Treasa DUNWORTH and Anna HOOD, eds., *Disarmament Law: Reviving the Field* (London, New York: Routledge, 2020), 102. Others, while discussing both victim assistance and environmental remediation, afford greater attention to the former obligation, see e.g. Daniel RIETIKER, “Winds of Change in Nuclear Disarmament: The Treaty on the Prohibition of Nuclear Weapons as a New Example of Humanitarian, Victim-centred Arms Control” (2018) *LI Suffolk University Law Review Online* 1.

¹⁹ See e.g. the limited discussion in Bonnie DOCHERTY, “From Obligation to Action: Advancing Victim Assistance and Environment Remediation at the First Meeting of States Parties to the Treaty on the Prohibition of Nuclear Weapons” (2020) 3 *Journal for Peace and Nuclear Disarmament* 253; Bahram GHIASSEE, “Treaty on the Prohibition of Nuclear Weapons: An Assessment of the Environmental Provisions” (2019) 4 *International Journal of Nuclear Governance, Economy and Ecology* 238.

Each State Party, with respect to areas under its jurisdiction or control contaminated as a result of activities related to the testing or use of nuclear weapons or other nuclear explosive devices, shall take necessary and appropriate measures towards the environmental remediation of areas so contaminated.

In brief, there are two potential ways in which the scope of nuclear weapons-related activities captured by Article 6(2) can be interpreted. First, under a “narrow” interpretation one could consider the remediation activities required by Article 6(2) as addressing *only* environmental contamination that has arisen from the testing and use of nuclear weapons as the only two activities explicitly identified by the text of Article 6(2). Here, the phrase “activities related to...” could capture some limited associated actions directly connected to a particular instance of nuclear weapons use or testing; for example, the disposal of radioactive waste following a specific a nuclear weapon test. However, further, less causally connected activities would not be captured by Article 6(2).

Alternatively, under a “broad” interpretation, one could argue that the phrase “activities related to the use or testing of nuclear weapons” could extend to capture additional steps connected to the nuclear weapons lifecycle, such as uranium mining, fissile material reprocessing, and nuclear waste disposal and storage. Endorsing this possibility, and demonstrating awareness of the devastating environmental impact of nuclear weapons related activities beyond testing and use noted above, Daniel Rietiker and Manfred Mohr of the International Association of Lawyers Against Nuclear Arms (IALANA) have questioned:

whether the terms “related to the testing or use of nuclear weapons” ... is broad enough to encompass activities such as uranium mining and milling, necessary for the production of nuclear weapons, as well as past practices for disposal of waste from the production or testing of nuclear weapons, such as ocean dumping.²⁰

This article ultimately seeks to consider this interpretative ambiguity in greater detail. Following this introduction, Part I begins by providing an overview of the various types of nuclear weapons-related environmental harms that exist, and could be captured under a broad interpretation of activities captured under Article 6(2) beyond testing and use. Part II then proceeds to determine the scope of activities captured under Article 6(2) by employing general rules of treaty interpretation under international law, reflected in Articles 31 and 32 of the 1968 Vienna Convention on the Law of Treaties (VCLT).²¹ Of specific interest here will be the ordinary meaning of the text which constitutes the source of the ambiguity in question and the *travaux préparatoires*, or negotiation history of the TPNW, which seemingly fails to clarify the scope of activities captures under Article 6(2). Additionally, some policy considerations as to why either a narrow or broad interpretation of nuclear weapons-related activities covered may prove favourable from a practical perspective are also considered in Part III.

Ultimately, this paper suggests that the scope of activities captured by Article 6(2), specifically the phrase “activities related to the testing or use of nuclear weapons”, remains uncertain following a careful application of the VCLT rules on treaty interpretation. Accordingly, it is recommended in the concluding Part IV that states parties should designate space within the future institutional settings of the TPNW, established pursuant

²⁰ Daniel RIETIKER and Manfred MOHR, “Treaty on the Prohibition of Nuclear Weapons: A Short Commentary Article by Article” *International Association of Lawyers Against Nuclear Arms (IALANA)* (April 2018), online: IALANA <https://www.ialana.info/wp-content/uploads/2018/04/Ban-Treaty-Commentary_April-2018.pdf> at 26–7.

²¹ *Vienna Convention on the Law of Treaties*, 23 May 1969, 1155 U.N.T.S. 331 (entered into force 27 January 1980) [VCLT].

to Article 8, in order to discuss, and in time clarify, the scope of activities covered under Article 6(2).

I. SUMMARY OF NUCLEAR WEAPONS-RELATED ENVIRONMENTAL HARMS

It is first necessary to highlight the vast forms of environmental damage that may arise from different aspects of the nuclear weapons “life-cycle”. Accordingly, this Part intends to provide a cursory overview of environmental harms that emerged from a range of nuclear weapons-related activities. The discussion begins by outlining the environmental harm caused by the testing and use of nuclear weapons, an activity that would be captured under *both* the narrow and broader interpretations of Article 6(2) mentioned briefly above. It then proceeds to address other forms of nuclear weapons-related environmental harms that could be captured and thus addressed, but *only* under a broader interpretation of Article 6(2), which includes damage from uranium mining/milling; fissile material reprocessing and storage; and the disposal of radioactive waste from nuclear reactors.

A. Nuclear Weapon Testing and Use

The initial detonation of a nuclear weapon following a particular test or use, particularly during the “blast phase”, can incinerate the immediately proximate environment, including flora, fauna, and agricultural lands²² with temperatures reaching similar levels to that of the sun.²³ The extent of environmental damage caused by nuclear weapons testing to former test sites has also been well documented.²⁴ Generally speaking, the widespread distribution of radioactive particles from either initial exposure, or subsequent “residual” radiation and fallout following the testing or use of nuclear weapons has resulted in the contamination of soil, vegetation, water sources, and marine environments, both locally and more distant to the testing site, much of which may last for decades after the event.²⁵

The devastating consequences of the “Castle Bravo” test conducted by the US in March 1954 demonstrates this very point.²⁶ The detonation of the 15-megaton nuclear explosive device over Bikini Atoll in the Marshall Islands resulted in a vast, unexpected dispersion of radioactive fallout beyond the anticipated 90-mile exclusion zone.²⁷ An attempt to return indigenous Marshallese populations to Bikini Atoll in the 1970s failed after sample

²² See e.g. the testimonies and evidence discussed by Becky ALEXIS-MARTIN, Matthew B. BOLTON, Dimity HAWKINS, Sydney TISCH, and Talei Lucia MANGIONI, “Addressing the Humanitarian and Environmental Consequences of Atmospheric Nuclear Tests: A Case Study of UK and US Test Programs at Kiritimati (Christmas) and Malden Island, Republic of Kiribati” (2021) 12 *Global Policy* 106 at 113–4.

²³ Erik V. KOPPE, *The Use of Nuclear Weapons and the Protection of the Environment During International Armed Conflict* (Oxford: Bloomsbury, 2009) at 61.

²⁴ Remus PRĂVĂLIE, “Nuclear Weapons Tests and Environmental Consequences: A Global Perspective” (2014) 43 *AMBIO: A Journal of the Human Environment* 729 at 741.

²⁵ *Ibid.*; United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), “Report of the United Nations Scientific Committee on the Effects of Atomic Radiation to the General Assembly Vol I” (2000), online: UNSCEAR <https://www.unscear.org/docs/publications/2000/UNSCEAR_2000_GA-Report.pdf> at 5; Beyza UNAL, Patricia LEWIS, and Sasan AGHLANI, “The Humanitarian Impacts of Nuclear Testing: Regional Responses and Mitigations Measures” *Chatham House International Security Department* (May 2017), online: Chatham House <<https://www.chathamhouse.org/sites/default/files/publications/research/2017-05-08-HINT.pdf>>.

²⁶ See, generally, Ariana ROWBERRY, “Castle Bravo: The Largest US Nuclear Explosion” *Brookings* (27 February 2014), online: Brookings <<https://www.brookings.edu/blog/up-front/2014/02/27/castle-bravo-the-largest-u-s-nuclear-explosion/>>.

²⁷ *Ibid.*

testing in 1978 showed high levels of the radioactive isotope caesium-137 in the groundwater, thereby displacing communities once more from their cultural land.²⁸

Additionally, the storage of radioactive waste and contaminated material following the testing of nuclear weapons can also result in environmental harm. For instance, the so-called Runit Dome in the Marshall Islands, a concrete structure built during the 1970s containing over 100,000 cubic yards of radioactive soil and debris from US testing activities in the Marshall Islands during the 1940s and 1950s,²⁹ is reportedly being damaged by rising sea levels and increasingly intense tropical storm surges as a result of climate change, resulting in the leaking of contaminated materials into the nearby lagoon.³⁰ Although this could be classed as radioactive waste storage or disposal, this evidently constitutes an activity that is intrinsically connected to nuclear weapon testing and use – in contrast to the disposal of waste by products in nuclear reactors and reprocessing activities discussed below.³¹

B. Uranium Mining

While environmental damage from the use and testing of nuclear weapons would be captured under both a narrow and broad interpretation of Article 6(2), other nuclear weapons-related activities would only fall within Article 6(2) if a broader interpretation of the phrase “activities related to the use or testing of nuclear weapons” is endorsed. The first additional activity that could be captured under a broader interpretation is environmental damage from uranium mining. Although the Nuclear Energy Agency (NEA) and the Organization for Economic Co-Operation and Development (OECD) describe uranium mining in 2014 as “the most regulated and one of the safest forms of mining in the world”,³² failures in applying regulatory standards and waste management practices still present the danger of environmental risks. Additionally, unregulated uranium mining activities continue to result in significant environmental damage and contamination that requires costly remediation efforts.³³

In brief, past uranium mining activities have resulted in uranium exposure to local communities and the surrounding ecosystem, resulting in damage and contamination to local flora, fauna, vegetation, and water sources, thereby impacting the food chain in locations near to mining facilities.³⁴ The grinding of uranium ore can also lead to the dispersion of hazardous dust and, in all cases, uranium mining is water-intensive and leaves

²⁸ Jack NIEDENTHAL, “Paradise Lost – ‘For the Good of Mankind’” *The Guardian* (6 August 2002), online: The Guardian <<https://www.theguardian.com/travel/2002/aug/06/travelnews.nuclearindustry.environment>>.

²⁹ U.S. Department of Energy, “Report on the Status of the Runit Dome in the Marshall Islands” *US Department of Energy*, Washington, DC 20585, (June 2020), online: U.S. Department of Energy <<https://www.energy.gov/sites/prod/files/2020/06/f76/DOE-Runit-Dome-Report-to-Congress.pdf>> at iii.

³⁰ *Ibid.*; Susanne RUST, “How the U.S. Betrayed the Marshall Islands, Kindling the Next Nuclear Disaster” *Los Angeles Times* (10 November 2019), online: Los Angeles Times <<https://www.latimes.com/projects/marshall-islands-nuclear-testing-sea-level-rise/>>.

³¹ See Part I.D.

³² Nuclear Energy Agency (NEA) and Organization for Economic Co-Operation and Development (OECD), “Managing Environmental and Health Impacts of Uranium Mining” (2014) NEA No. 7062, online: OECD iLibrary <https://read.oecd-ilibrary.org/nuclear-energy/managing-environmental-and-health-impacts-of-uranium-mining_9789264216044-en> at 9.

³³ See e.g. the conclusions reached by Ben HEARD, “Environmental Impacts of Uranium Mining in Australia: History, Progress and Current Practice” *Minerals Council of Australia, Policy Paper* (May 2017), online: Minerals Council of Australia <https://www.minerals.org.au/sites/default/files/Environmental%20impacts%20of%20uranium%20mining%20in%20Australia_May%202017_WEB.pdf>.

³⁴ See e.g. the findings reached during an International Workshop held by the International Atomic Energy Agency (IAEA), “Environmental Contamination from Uranium Production Facilities and their Remediation”

behind vast quantities of radioactive waste.³⁵ Additionally, while the manner in which raw uranium is extracted can vary,³⁶ the use of chemicals to dissolve uranium underground during “in situ” leaching can often result in contamination of groundwater. For example, during the 1960s and 70s at the Stráž pod Ralskem plant in Czech Republic, the over saturation of injected chemicals into the uranium deposits located underground resulted in widespread groundwater contamination.³⁷

Finally, the “tailings” (waste by-products) of uranium mining are particularly concerning from an environmental perspective as they contain significant radioactive substances from the mined uranium ore, including radon, selenium, uranium, and thorium, and often contain chemical agents and heavy metals used in the extraction or “milling” process.³⁸ Inadequate safety practices at the Helmsdorf tailings impoundment in East Germany during the Cold War led to the leaking of radioactive and chemical toxins downstream towards local communities.³⁹ The OECD has reported that “very little rehabilitation” occurred at Helmsdorf, with the former Soviet Union prioritizing uranium production capacity, thus resulting in severe environmental damage during the plants operation.⁴⁰

It is worth acknowledging that uranium mining is not solely a component of nuclear weapons production. On the contrary, uranium mining also constitutes a significant aspect of nuclear power generation, providing the fuel for nuclear reactors in many states globally. In this sense, the environmental damage stemming from such mining activities is not solely a consequence of nuclear weapons production but is, in fact, an outcome of nuclear-related activity more generally. With this in mind, the question as to whether uranium mining can ever be regarded as an activity that is solely related to the use and testing of nuclear weapons is subject to debate. In any case, however, one can argue that a broader interpretation of Article 6(2) would nonetheless be flexible enough to capture at least some uranium mining activities within its scope.

C. Fissile Material Reprocessing Facilities

Another type of environmental damage that would be captured under a broad interpretation of the phrase “activities related to the use or testing of nuclear weapons” is harm stemming from fissile material reprocessing facilities – an activity that is essential in creating the highly enriched uranium needed for nuclear weapons. The reprocessing and storage of fissile material has resulted in significant environmental contamination due to major accidents that occurred as a result of the highly combustible nature of enriched uranium and plutonium, and the mismanaged disposal of waste materials during the production process.⁴¹ Often, the spent nuclear fuel from civilian, nuclear energy producing reactors is “reprocessed” in order to extract plutonium that can be used as fissile material

IAEA, *Lisbon* (11–13 February 2004), online: IAEA Publications <https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1228_web.pdf>.

³⁵ *Ibid.*

³⁶ The process is either open pit mining, underground mining, or in situ leaching, see usefully Rajiv R. SRIVASTAVA, Pankaj PATHAK, and Mosarrat PERWEEN, “Environmental and Health Impact Due to Uranium Mining” in Charmendra K. GUPTA and Clemens WALTHER, eds., *Uranium in Plants and the Environment* (Cham: Springer, 2020), 69 at 73–5.

³⁷ NEA and OECD, *supra* note 32 at 74.

³⁸ See IAEA, *supra* note 34.

³⁹ NEA and OECD, *supra* note 32 at 83.

⁴⁰ *Ibid.*

⁴¹ See Andrea PAULILLO, Jonathan M DODDS, Andrew MILLIKEN, Stephen J PALETHORPE, and Paola LETTIERI, “The Environmental Impacts of Reprocessing Used Nuclear Fuels: A UK Case Study” (2020) 25 *Sustainable Materials and Technologies* e00186.

for nuclear weapons. Such activities have frequently resulted in significant environmental contamination of the local environment due to the disposal of waste materials during the production process,⁴² and have also resulted in major radiation-related accidents due to the highly combustible nature of enriched uranium and plutonium.

For example, in both 1957 and 1969 at the Rocky Flats processing plant in Denver, a plutonium fire occurred and contaminated the nuclear facilities, resulting in lingering radiation exposure to the local area.⁴³ Similarly, at the Sellafield reprocessing site in the UK, a Level 5 event on the International Nuclear and Radiological Event Scale⁴⁴ occurred in October 1957 after a uranium rod ruptured following a routine heating exercise of the graphite control blocks, causing a massive, uncontrolled fire in Pile Number 1. The “Windscale Fire” resulted in the largest dispersion of radioactive particles into the atmosphere recorded in the UK as the uranium rods began to oxidize.⁴⁵ Finally, at the Mayak plutonium production and reprocessing plant in Russia, radioactive waste from fissile material storage was deliberately disposed into the nearby Lake Karachai and Techa river system by the former Soviet Union, resulting in higher concentrations of radionuclides in indigenous flora and fauna.⁴⁶ Radiation leaks that swept across Europe as recently as 2017 have been traced back to the Mayak facility by a 2019 scientific study.⁴⁷

D. Radioactive Waste Storage/Disposal

Another significant source of environmental damage captured by a broad interpretation of Article 6(2) stems from the storage of radioactive material and “waste” during the life cycle of nuclear weapons production and testing, including spent fuel from nuclear reactors and waste generated by nuclear propulsion,⁴⁸ alongside the aforementioned disposal and storage of radioactive waste and other contaminated materials following nuclear weapons testing activities.⁴⁹ The storage of such waste often poses complex challenges.⁵⁰ Although certain “spent” nuclear fuel from nuclear reactors and reprocessing facilities is

⁴² See “Environment and Nuclear Weapons” *Reaching Critical Will*, online: Reaching Critical Will <<https://www.reachingcriticalwill.org/resources/fact-sheets/critical-issues/4734-environment-and-nuclear-weapons>> [Environment and Nuclear Weapons].

⁴³ See Roger J. MATSON, “An Assessment of Criticality Safety at the Department of Energy Rocky Flats Plant Golden, Colorado (July–September 1989)” Report of the US Department of Energy, DOE/EH/79081-T1, 1 September 1989, particularly at 2–8 to 2–9.

⁴⁴ The International Nuclear and Radiological Event Scale is an indicator developed by the IAEA that symbolises the significance of a particular nuclear accident or event to the wider public, see “International Nuclear and Radiological Event Scale (INES)” IAEA, online: IAEA <<https://www.iaea.org/resources/databases/international-nuclear-and-radiological-event-scale>>.

⁴⁵ See John A GARLAND and Richard WAKEFORD, ‘Atmospheric Emissions from the Windscale Accident of October 1957’ (2007) 41 *Atmospheric Environment* 3904.

⁴⁶ For an extensive summary of activities at Mayak, see Charles DIGGES, Alexander NIKITIN, and Andrei OZAROVSKY, “Questions of Handling the Legacy of Radioactive Contamination at the Mayak Production Association”, Bellona, Working Paper, 2018.

⁴⁷ Georg STEINHAUSER et al., “Airborne Concentrations and Chemical Considerations of Radioactive Ruthenium from Undeclared Major Nuclear Release in 2017” (2019) 116 *Proceedings of the National Academic of Sciences* 16750.

⁴⁸ See generally Rodney C EWING, William J. WEBER, and Frank W. CLINARD Jr, “Radiation Effects in Nuclear Waste Forms for High-Level Radioactive Waste” (1995) 29 *Progress in Nuclear Energy* 63.

⁴⁹ See Part I.A.

⁵⁰ Charles DIGGES, “Before the Bombs Go Off: The Environmental and Health Consequences of Nuclear Weapons Production” *Bellona* (26 December 2012), online: Bellona <https://bellona.org/news/nuclear-issues/nuclear-russia/2012-12-before-the-bombs-go-off-the-environmental-and-health-consequences-of-nuclear-weapons-production#_ftn3>.

composed of low-level radioactive waste that can be disposed of with relative ease, other highly contaminated waste requires deep geological storage facilities specifically designed to protect humans and the environment from radiation exposure, which allow for radioactive decay and heat reduction over long periods of time.⁵¹ Unsurprisingly, few states desire such radioactive material to be present within their territories and only a handful of countries, including Finland and Sweden, are building underground facilities to store highly contaminated nuclear waste.⁵²

Other accidents at nuclear waste storage facilities have also occurred, notably at the Hanford Nuclear Reservation in Washington State, US. The civil society group *Reaching Critical Will* reports that approximately 50 of the 177 storage tanks “present an immediate threat of explosion due to a gaseous build-up of a variety of chemical constituents and their decay products”.⁵³ Additionally, *Reaching Critical Will* reports that some of these storage tanks at Hanford have “already ruptured and their radioactive contents have leaked into the ground”.⁵⁴ Similarly, in September 1957 – coincidentally occurring just a few days prior to the Windscale Fire – a storage tank containing nuclear waste materials at Mayak exploded, which resulted in the evacuation of local communities as the radioactive fallout contaminated an area of approximately 15,000–20,000 square kilometres.⁵⁵

As noted in Part I.A., it is likely that some radioactive waste and contamination stored or left unaddressed following a particular instance of use or testing would be captured under a narrow reading of Article 6(2). This would mean that some radioactive waste storage sites, such as the Runit Dome in the Marshall Islands, would fall within the ambit of Article 6(2). Rather, it is only other radioactive waste and storage from earlier in the nuclear weapons production process that would be captured by a broader interpretation of Article 6(2) because such forms of contamination would lack a direct causal connection to the use or testing of nuclear weapons compared to the waste and contamination left at former test sites.

E. Summary

This Part has aimed to provide just a brief flavour of the different types of environmental damage caused by nuclear weapons-related activities that would be captured under both a narrow and broad interpretation of Article 6(2). Clearly, environmental damage can arise from various stages of the nuclear weapons life cycle, which in turn makes clear the importance of determining precisely which of the activities described above would be captured under Article 6(2). With this in mind, the remainder of this article seeks to examine this very question in greater detail.

II. INTERPRETING ARTICLE 6(2)

In light of the identified forms of environmental damage stemming from both the testing and use of nuclear weapons, alongside environmental harm stemming from other nuclear

⁵¹ IAEA, “Storage of Spent Nuclear Fuel” *IAEA Safety Standards, No. SSG-15 (Rev.1)* (2020), online: IAEA Publications <https://www-pub.iaea.org/MTCD/Publications/PDF/P1882_web.pdf> at 5.

⁵² James CONCA, “Finland Breaks Ground on World’s First Deep Geological Nuclear Waste Repository” *Forbes* (21 May 2021), online: *Forbes* <<https://www.forbes.com/sites/jamesconca/2021/05/31/finland-breaks-ground-on-its-deep-geologic-nuclear-waste-repository/?sh=55b370116103>>.

⁵³ *Environment and Nuclear Weapons*, *supra* note 42.

⁵⁴ *Ibid.*

⁵⁵ See Alexander V. AKLEYEV, Lyudmila Yu KRESTININA, Marina O. DEGTEVA, and Evgenia I. TOLSTYKH, “Consequences of the Radiation Accident at the Mayak Production Association in 1957 (the ‘Kyshtym Accident’)” (2017) 37 *Journal of Radiological Protection* 19.

weapons-related activities that would be captured under a broader interpretation of Article 6(2), the discussion now turns to interpreting Article 6(2) in order to assess whether the language of this provision supports either a broad or narrow reading of the phrase “activities related to the testing and use of nuclear weapons”. For this, the general rules of treaty interpretation developed by the International Law Commission (ILC) – subsequently confirmed by the International Court of Justice (the Court or ICJ) – to reflect customary international law⁵⁶ contained under Articles 31 and 32 of the VCLT will be employed.

Consequently, this Part will begin by first examining the ordinary meaning of Article 6 (2) in light of the TPNW’s context, object, and purpose, before turning to the *travaux préparatoires*, or negotiation history, of the TPNW to reveal whether the *United Nations (UN) Conference to Negotiate a Legally Binding Instrument to Prohibit Nuclear Weapons, Leading Towards Their Total Elimination* (2017 Conference) sheds any light on the scope of activities caught by Article 6(2). Ultimately, it will be revealed that the application of Articles 31 and 32 of the VCLT does not provide a sufficiently clear answer as to whether a broad or narrow approach of the nuclear weapons-related activities is captured by Article 6(2) with any certainty, leaving significant ambiguity that remains to be resolved in due course.

A. Ordinary Meaning

Treaty interpretation under international law is an inexact science, and the application of the three traditional approaches to treaty interpretation – the textual, intent, and teleological schools⁵⁷ – have given rise to considerable academic debate.⁵⁸ The adoption of the VCLT rules by the ILC sought to incorporate each of these schools to some degree, and provide clarification as to how one should engage in the interpretative process. Nevertheless, the VCLT interpretation rules have been described as vague, leaving significant room for individual discretion in the way in which they should be applied.⁵⁹ The article does not seek to delve into conceptual or theoretical discussions on the basis of treaty interpretation under international law. Suffice to say, this author takes the position that the VCLT interpretation rules under Articles 31 and 32 provide a useful and appropriate means of engaging in the legal analysis required here.

To begin, Article 31(1) states that a treaty shall be interpreted “in *good faith* in accordance with the *ordinary meaning* to be given to the terms of the treaty in their *context* and in light of its *object and purpose*”. A treaty’s context includes its preamble and any attached annexes or agreements made by the parties in connection with the adoption of the treaty.⁶⁰ The ILC has emphasized that the ordinary meaning of a treaty’s text must be considered the “starting point” for interpretation and must be presumed “*to be the authentic*

⁵⁶ See *Territorial Dispute (Libyan Arab Jamahiriya/Chad)*, [1994] I.C.J. Rep. 6 at para. 41; *LaGrand (Germany v. United States of America)*, [2001] I.C.J. Rep. 466 at para. 99.

⁵⁷ Anthony AUST, *Modern Treaty Law and Practice*, 3rd ed. (Cambridge: Cambridge University Press, 2013) at 206–7. See also Francis G JACOBS, “Varieties of Approach to Treaty Interpretation: With Special Reference to the Draft Convention on the Law of Treaties Before the Vienna Diplomatic Conference” (1969) 18 *International and Comparative Law Quarterly* 318 at 318–20.

⁵⁸ Ian SINCLAIR, *The Vienna Convention on the Law of Treaties*, 2nd ed. (Manchester: Manchester University Press, 1984) at 114.

⁵⁹ As noted by Shai DOTHAN, “The Three Traditional Approaches to Treaty Interpretation: A Current Application to the European Court of Human Rights” (2019) 42 *Fordham International Law Journal* 765 at 767.

⁶⁰ VCLT, *supra* note 21, art. 31(2).

expression of the intention of the parties” (emphasis added).⁶¹ The ICJ has, similarly, endorsed this view, confirming that “interpretation must be based above all upon the text of the treaty”.⁶² Applying this starting point, it becomes apparent that the ordinary meaning of the text itself introduces the source of the uncertainty surrounding the scope of nuclear weapons-related activities, captured by and thus requiring environmental remediation pursuant to Article 6(2).

On the one hand, the ordinary meaning of the TPNW seemingly provides support for a narrow scope of activities caught under Article 6(2). To begin with, the fact that Article 6(2) explicitly references nuclear weapons testing and use as the only activities expressly mentioned in the provision itself suggests that a narrower interpretation is implied. This view gains further support when one takes into consideration the comprehensive range of prohibitions incorporated under Article 1. Indeed, as Article 1 forms part of the TPNW’s context pursuant to Article 31(2) of the VCLT, the fact that *only* the testing and use of nuclear weapons are explicitly mentioned in Article 6(2), out of the extremely comprehensive range of other activities prohibited by the TPNW, suggests that a narrower interpretation is supportable.

Furthermore, Article 6(2) stands in contrast to a somewhat comparable “Environmental Security” provision of the 2006 Treaty on a Nuclear-Weapon-Free Zone in Central Asia (Treaty of Semipalatinsk), where states parties undertake:

to assist any efforts toward the environmental rehabilitation of territories contaminated as a result of past activities related to the development, production or storage of nuclear weapons or other nuclear explosive devices, in particular uranium tailings storage sites and nuclear test sites.⁶³

Evidently, based on the clear language and use of terms, the scope of activities captured by Article 6 of the Treaty of Semipalatinsk could seemingly be extended further down the production process of nuclear weapons with little controversy, perhaps capturing initial uranium mining activities (among other forms of environmental damage in the production and storage phase of nuclear weapons) without overextending the ordinary meaning of the provision. Conversely, however, this expanded approach seems difficult to reconcile with the more limited, explicitly identified activities cited in Article 6(2) of the TPNW; that is, the testing and use of nuclear weapons.

On the other hand, despite the fact that only the testing and use of nuclear weapons are explicitly mentioned in Article 6(2), the inclusion of the preceding phrase “activities related to...” would equally seem to allude to a broader range of activities, one that would encompass additional activities that are closely connected to either nuclear weapons use or testing. This rationale has received considerable support from academic commentary on Article 6(2), which has endorsed, or at least questioned, whether a broader interpretation could be reached based on the TPNW’s text.⁶⁴ For instance, Nystuen, Egeland, and Graff Hugo have suggested that the scope of Article 6(2) “covers contamination resulting from, for example, production, transport or stockpiling of nuclear weapons, as these are ‘activities related to’ testing and use”.⁶⁵ Ghiassee has also endorsed the position that

⁶¹ Report of the International Law Commission on the Work of its Eighteenth Session, United Nations Yearbook of International Law Commission, Vol II, UN Doc A/6309/Rev.1 (1966), 169 at 220.

⁶² Territorial Dispute (Libyan Arab Jamahiriya/Chad), [1994] I.C.J. Rep. 6 at para. 41.

⁶³ Treaty on a Nuclear-Weapon-Free Zone in Central Asia, 8 September 2006, 2970 U.N.T.S. (entered into force 21 March 2009), art 6 [Treaty of Semipalatinsk].

⁶⁴ See e.g. the aforementioned quote by Rietiker and Mohr, *supra* note 20.

⁶⁵ Gro NYSTUEN, Kjølv EGELAND, and Torbjørn GRAFF HUGO, “The TPNW and its Implications for Norway” *Norwegian Academy of International Law* (September 2018) at 9.

Article 6(2) should “consider the environmental contamination associated with nuclear weapons at every stage of their life cycle”.⁶⁶ There has additionally been some suggestion that the language and subsequent obligation imposed by Article 6 in general – applying to both victim assistance and environmental remediation – could feasibly be extended to incorporate harms and damage stemming from accidents involving nuclear weapons.⁶⁷

Taking a somewhat similar, though more cautiously phrased, line of reasoning is Moffatt, who has argued:

Therefore, it may seem arguable to perhaps interpret Article 6(2) as requiring environmental remediation of areas where activities such as mining, milling or disposal have taken place, those activities have in fact resulted in contamination and these activities were exclusively performed not for peaceful purposes, but only “related to [...] testing or use”.⁶⁸

This position is somewhat more restrained and illustrates a possible means of extending the scope of activities covered by Article 6(2) to partially incorporate activities whose “exclusive purpose” was to contribute to nuclear weapon testing and use rather than peaceful applications of nuclear technology.⁶⁹ Accordingly, while the disposal of radioactive waste following a particular nuclear weapons test would be caught by Moffatt’s approach, environmental contamination from activities that lack a sufficiently clear “causal nexus” to nuclear weapon testing and use, such as uranium mining, which can further both peaceful uses of nuclear technology and nuclear weapons production, may remain beyond the scope of Article 6(2). This hardly seems controversial from an interpretative point of view, but fails to precisely confirm how far one can extend the coverage of Article 6(2).

Moreover, it is notable that when one considers the context of Article 6 as a whole, Article 6(1), addressing victim assistance, employs the following language:

Each State Party shall, with respect to *individuals under its jurisdiction who are affected by the use or testing of nuclear weapons*, in accordance with applicable international humanitarian and human rights law, adequately provide age- and gender-sensitive assistance, without discrimination, including medical care, rehabilitation and psychological support, as well as provide for their social and economic inclusion⁷⁰ (emphasis added).

Clearly, therefore, Article 6(1) stands in distinction from the language of Article 6(2) somewhat, and only refers to “individuals under its jurisdiction who are affected by the use or testing of nuclear weapon”, thus omitting the preceding phrase “activities related to...” This would suggest that victim assistance should be provided to individuals affected *specifically* by the testing or use of nuclear weapons rather than a potentially broader range of connected activities. By contrast, the inclusion of the additional phrase “activities related to...” within Article 6(2) gains greater interpretative significance and,

⁶⁶ Bahram GHASSEE, “The Need to Enhance the Environmental Provisions of the Treaty on the Prohibition of Nuclear Weapons” *UK Environmental Law Association Newsletter*, Issue 121 (November/December 2020), online: UK Environmental Law Association <<https://www.ukela.org/common/Uploaded%20files/elaw/e-law%20121.pdf>> at 20.

⁶⁷ James REVILL, Renata H. DALAQUA, and Wilfred WAN, “The TPNW in Practice: Elements for Effective National Implementation” (2021) 4 *Journal for Peace and Nuclear Disarmament* 13 at 25.

⁶⁸ Michael J. MOFFATT, “In Search of the Elusive Conflict: The (In-)Compatibility of the Treaties on the Non-Proliferation and Prohibition of Nuclear Weapons” (2019) 102 *Nuclear Law Bulletin* 7 at 39.

⁶⁹ *Ibid.* Indeed, Moffatt argues that mining and other activities are “neither specific to testing or using, nor nuclear explosive devices in general”.

⁷⁰ TPNW, *supra* note 1, art. 6(1).

arguably, supports the position that a potentially broader range of connected activities are caught under the scope of environmental remediation within the TPNW.

Furthermore, if a more limited scope of activities requiring environmental remediation was desired, it is unclear why the state participants at the 2017 Conference did not simply incorporate the following (or similar) language:

Each State Party, with respect to areas under its jurisdiction or control contaminated as a result of the testing or use of nuclear weapons or other nuclear explosive devices, shall take necessary and appropriate measures towards the environmental remediation of areas so contaminated.

This hypothetical language is evidently more limited than Article 6(2) as is presently worded by omitting the phrase “activities related to ...”, which gives rise to the aforementioned ambiguity. At the same time, however, and by using the same logic, if participating states during the 2017 Conference desired a broader range of activities to be covered by the positive obligation established by Article 6(2), it is equally unclear why this was not expressly mentioned in the text in a similar manner to the language adopted by states parties to the Treaty of Semipalatinsk, noted previously.⁷¹ Evidently, therefore, the ordinary meaning of Article 6(2) provides little conclusive evidence one way or the other as to the scope of nuclear weapons-related activities captured by environmental remediation in the TPNW.

B. Negotiation History

Evidently, there are reasonable arguments to interpret the scope of activities covered under Article 6(2) in both a broad and narrow sense in light of the ordinary meaning of the text under Article 31 of the VCLT. This ambiguity means that it is necessary to examine whether the negotiation history, or *travaux préparatoires*, of the TPNW from the 2017 Conference can shed any further light on the scope of Article 6(2). Within treaty interpretation, Article 32 of the VCLT confirms that recourse to the *travaux préparatoires* of a treaty is permissible in order to determine the meaning of a treaty’s terms when the interpretation under Article 31 of the VCLT either: “a) leaves the meaning ambiguous or obscure; or b) leads to a result which is manifestly absurd or unreasonable”. Again, however, the *travaux préparatoires* offered little assistance in clarifying the scope of activities captured by Article 6(2).

The importance of incorporating provisions on environmental remediation in any proposed treaty text was first emphasized during the 2016 Open-Ended Working Group (OEWG) established pursuant to UN General Assembly (UNGA) Resolution 70/33.⁷² Here, both states⁷³ and civil society groups, including ICAN, emphasized the importance of including positive obligations to “address damage to affected environments” in any instrument designed to prohibit and eliminate nuclear weapons.⁷⁴ Ultimately, as well

⁷¹ Treaty of Semipalatinsk, *supra* note 63, art. 6.

⁷² Resolution Adopted by the General Assembly on 7 December 2015, GA Res. 70/33, UN Doc. A/RES/70/33 (11 December 2015).

⁷³ See e.g. *Elements for a Treaty Banning Nuclear Weapons*, Submitted by Fiji, Nauru, Palau, Samoa, and Tuvalu, UN Doc. A/AC.286/WP.14 (3 March 2016), at para. 16; Annika THUNBORG (Director of the Department of Disarmament, Non-proliferation and Export Control, Swedish Ministry for Foreign Affairs), “Statement on Elements, Panel IV” OEWG (9 May 2016), online: Reaching Critical Will <https://www.reachingcriticalwill.org/images/documents/Disarmament-fora/OEWG/2016/Statements/09May_Sweden.pdf> at 2.

⁷⁴ “Statement of ICAN at the OEWG” OEWG (23 February 2016), online: Reaching Critical Will <https://www.reachingcriticalwill.org/images/documents/Disarmament-fora/OEWG/2016/Statements/23Feb_ICAN.pdf> at 2;

as recommending the convening of the 2017 Conference by the UNGA,⁷⁵ the Final Report of the OEWG published in September 2016 expressly noted that “[p]ossible elements of such an instrument could include... (f) recognition of the rights of victims of the use and testing of nuclear weapons and a commitment to provide assistance to victims and to *environmental remediation*”⁷⁶ (emphasis added).

Nevertheless, as the 2017 Conference began, there was a degree of hesitancy among participating states, and even some civil society activists, as to whether positive obligations should be included in the final treaty.⁷⁷ This tentativeness was reflected in the absence of any mentioning of positive obligations in UNGA Resolution 71/258, establishing the mandate of the 2017 Conference.⁷⁸ To counter this hesitancy, those who supported the inclusion of including positive obligations on environmental remediation presented this as a “different type of clearance” obligation, such as previously contained in the Anti-Personnel Mine Ban Treaty 1997 and the Convention on Cluster Munitions 2008 by its proponents, adapted to address the unique forms of harms stemming from nuclear weapons-related remnants and radioactive contamination.⁷⁹ Equally, supporters of environmental remediation also emphasized the need to avoid “stepping backwards” from the existing precedent set by earlier humanitarian disarmament instruments in addressing the harms and damage caused by controversial weapons.⁸⁰

This argumentative framing proved successful and, as the March 2017 session progressed, there were numerous calls from both states and civil society to incorporate environmental remediation provisions in the final treaty text – though the language proposed varied. On the one hand, according to a working paper distributed by Pace University, “16 states plus CARICOM expressed support in their statements for environmental remediation of areas contaminated by the use (including testing) of nuclear weapons”.⁸¹ However, the majority of statements that favoured the inclusion of some form of environmental remediation provision failed to specify in detail the extent of the obligation to be included.⁸² This lack of detailed discussion and elaboration by states regarding

Thomas NASH, “Article 36 Remarks to OEWG” OEWG (23 February 2016), online: Reaching Critical Will <https://www.reachingcriticalwill.org/images/documents/Disarmament-fora/OEWG/2016/Statements/23Feb_Article36.pdf> at 2.

⁷⁵ *Taking Forward Multilateral Nuclear Disarmament Negotiations*, Report of the OEWG, UN Doc. A/71/371 (1 September 2016), at para. 34, 67.

⁷⁶ *Ibid.*, at para. 35.

⁷⁷ Bonnie DOCHERTY, “Completing the Package: The Development and Significance of Positive Obligations in Humanitarian Disarmament Law” in Treasa DUNWORTH and Anna HOOD, eds., *Disarmament Law: Reviving the Field* (London; New York: Routledge, 2020), 57 at 68. For a useful discussion of the development of positive obligations in the TPNW negotiations, see Matthew B. BOLTON and Elizabeth MINOR, “The Agency of International Humanitarian Disarmament Law: The Case of Advocacy for Positive Obligations in the Treaty on the Prohibition of Nuclear Weapons” in Matthew B. BOLTON, Sarah NJERI, and Taylor BENJAMIN-BRITTON, eds., *Global Activism and Humanitarian Disarmament* (Cham: Palgrave Macmillan, 2020), 59 at 71–85.

⁷⁸ *Resolution Adopted by the General Assembly on 23 December 2016*, GA Res. 71/258, UN Doc. A/RES/71/258 (11 January 2017).

⁷⁹ Docherty, *supra* note 77 at 68.

⁸⁰ See e.g. Bonnie DOCHERTY, “Advancing Humanitarian Disarmament Through the Ban Treaty” (2017) 1 *Nuclear Ban Daily* 5. See also Elizabeth MINOR, “The Prohibition of Nuclear Weapons: Assisting Victims and Remediating the Environment” ICRC: *Humanitarian Law and Policy* (10 October 2017), online: ICRC <<https://blogs.icrc.org/law-and-policy/2017/10/10/the-nuclear-weapons-ban-assisting-victims-and-remediating-the-environment/>> (“[p]art of this argumentation involved making the case that the treaty should not take a step back from recent international law on the prohibition of certain weapons”).

⁸¹ *Humanitarian Positive Obligations for a Nuclear Weapons Ban Treaty*, Working Paper submitted by Pace University International Disarmament Institute, UN Doc. A/CONF.229/2017/NGO/WP.22 (26 May 2017), at para. 9.

⁸² See notably, “Statement delivered by Ambassador Walton Webson of Antigua and Barbuda on behalf of CARICOM” *United Nations Conference to Negotiate a Legally Binding Instrument to Prohibit Nuclear Weapons, Leading*

the scope of nuclear weapons-related activities that would be captured by any adopted environmental remediation obligation would become a common theme throughout the 2017 Conference.

Other participants, however, called for a broader range of nuclear weapons-related activities to be explicitly included within, and thus addressed by any environmental remediation obligation established. Papua New Guinea, for instance, suggested that the phrase “activities related to the use, testing, production or storage of nuclear weapons in their territory” could be included in connection with environmental remediation.⁸³ Similarly, the Women’s International League for Peace and Freedom argued for a broader interpretation on the grounds that “[t]he ban treaty should reflect the need to rehabilitate territories that have been contaminated as a result of activities related to the use, development, testing, production, transit, transshipment, or storage of nuclear weapons in their territory”.⁸⁴

Evidently, the inclusion of either or a combination of both of these proposals would have closely aligned with the explicitly broad language adopted under Article 6 of the Treaty of Semipalatinsk discussed above. This, in turn, suggested that the nuclear weapons-related activities captured by such a proposed environmental remediation of the prospective treaty would have had a broad ambit beyond solely testing and use.

Facing these contrasting viewpoints and positions on environmental remediation during the March 2017 session, conference president, Whyte Gómez, incorporated environmental remediation provisions into the 22 May 2017 Draft Convention Text,⁸⁵ explaining how the initial draft represented an attempt to “synthesize the many areas where the views of States converged, and incorporated those elements which are ripe, well considered and deemed to constitute a basis for building consensus”.⁸⁶ The adopted Draft Article 6(2) read as follows:

Each State Party with respect to areas under its jurisdiction or control contaminated as a result of activities related to the testing or use of nuclear weapons or other nuclear explosive devices, shall have the right to request and to receive assistance toward the environmental remediation of areas so contaminated.⁸⁷

Accordingly, despite the above proposals to explicitly include further activities beyond the testing and use of nuclear weapons within the context of environmental remediation during the March 2017 session, no language to this effect was incorporated into the 22 May 2017 draft. In addition, as the June-July 2017 session commenced, virtually no state delegation sought to address, provide clarification, or advance detailed positions on the scope of activities explicitly mentioned within Article 6(2), or clarify the contours of the phrase “contaminated as a result of activities related to the testing or use of nuclear

Towards Their Total Elimination (29 March 2017), online: Reaching Critical Will <https://www.reachingcriticalwill.org/images/documents/Disarmament-fora/nuclear-weapon-ban/statements/29March_CARICOM-T2.pdf>.

⁸³ *Possible Elements for the UN Nuclear-Weapon-Ban Treaty*, Working Paper submitted by Papua New Guinea, UN Doc. A/CONF.229/2017/WP.4 (10 May 2017), at para. 9.

⁸⁴ *Banning Nuclear Weapons: Positive Obligations and Other Elements of a Legally Binding Instrument*, Working Paper submitted by the Women’s International League for Peace and Freedom, UN Doc. A/CONF.229/2017/NGO/WP.3 (17 March 2017), at para. 5.

⁸⁵ *Draft Convention on the Prohibition of Nuclear Weapons*, UN Doc A/CONF.229/2017/CRP.1 (22 May 2017).

⁸⁶ *Communique from President Elaine Whyte GÓMEZ, “Draft Legally Binding Instrument to Prohibit Nuclear Weapons, Leading Towards Their Total Elimination” United Nations Conference to Negotiate a Legally Binding Instrument to Prohibit Nuclear Weapons, Leading Towards Their Total Elimination* (22 May 2017), online: UN Conference Website <https://s3.amazonaws.com/unoda-web/wp-content/uploads/2017/05/Letter-from-the-Chair_May-24-2017.pdf> at 1.

⁸⁷ *Draft Convention on the Prohibition of Nuclear Weapons*, *supra* note 85, art. 6(2).

weapons or other nuclear explosive devices” in plenary discussions of Draft Article 6 held on 20 June 2017.⁸⁸ Instead, the plenary discussions concerning Draft Article 6(2) centred primarily around strengthening the draft’s language into a legally binding obligation imposed upon affected states parties to take positive steps towards remediation themselves⁸⁹ rather than simply having a “right to request and to receive assistance toward the environmental remediation of areas so contaminated”.⁹⁰

Discussions then shifted to a series of informal, behind closed doors negotiations, with further consideration of Article 6 facilitated by Ambassador Alfredo Labbé of Chile as part of the specific agenda topic on “Positive Obligations” for the June–July 2017 session.⁹¹ Although no public records of the discussions, statements, and the position of participating states in the working group are available, it is telling that the final recommendations adopted on 30 June 2017 by the group neither clarified the meaning of the phrase “activities related to the testing and use of nuclear weapons”, or incorporated additional activities explicitly. This is despite certain civil society groups, including the IALANA⁹² and the Italian branch of the ICAN, advancing recommendations to explicitly include reference to the “production” stage of nuclear weapons under Article 6 generally in relation to both victim assistance and environmental remediation.⁹³

Accordingly, the proposed text adopted by the discussion group merely strengthened the nature of the obligation established by requiring states parties to engage in remediation efforts rather than simply incorporating a limited right to seek and request assistance towards this goal, as was originally included in the 22 May 2017 draft. The recommended text agreed upon by the informal working group on Article 6, and shared by Ambassador Labbé on 30 June 2017 to the 2017 Conference, ultimately read as follows:

Each State Party with respect to areas under its jurisdiction or control contaminated as a result of activities related to the testing or use of nuclear weapons or other nuclear explosive devices, shall take necessary and appropriate measures towards the environmental remediation of areas so contaminated.⁹⁴

⁸⁸ “Audiovisual Records, 17th Meeting” *United Nations Conference to Negotiate a Legally Binding Instrument to Prohibit Nuclear Weapons, Leading Towards Their Total Elimination* (20 June 2017), online: UN WebCast <<https://www.unmultimedia.org/avlibrary/asset/1914/1914100/>>.

⁸⁹ See e.g. Elizabeth MINOR (ICAN Representative), “Cluster 4: Positive Obligations” *United Nations Conference to Negotiate a Legally Binding Instrument to Prohibit Nuclear Weapons, Leading Towards Their Total Elimination* (20 June 2017), online: Reaching Critical Will <https://reachingcriticalwill.org/images/documents/Disarmament-fora/nuclear-weapon-ban/statements/20June_ICAN.pdf>; *Comments of the International Committee of the Red Cross on Key Provisions of the Draft Convention on the Prohibition of Nuclear Weapons*, UN Doc. A/CONF.229/2017/CRP.2 (14 June 2017), at 5–6; Erin HUNT, “Statement by Mines Action Canada” *United Nations Conference to Negotiate a Legally Binding Instrument to Prohibit Nuclear Weapons, Leading Towards Their Total Elimination* (20 June 2017), online: Reaching Critical Will <https://reachingcriticalwill.org/images/documents/Disarmament-fora/nuclear-weapon-ban/statements/20June_MAC.pdf> at 1.

⁹⁰ *Ibid.* Such language would have reflected the meagre obligation under the *Treaty of Semipalatinsk*, *supra* note 62, art. 6.

⁹¹ *Agenda Item 5, Indicative Timetable for the Meetings of the Conference*, UN Doc. A/CONF.229/2017/3/Add.1/Rev.1 (12 June 2017).

⁹² *Nuclear-Armed States, Positive Obligations, Institutional Issues, and Final Clauses: Further Comments*, Prepared by the International Association of Lawyers Against Nuclear Arms, UN Doc. A/CONF.229/2017/NGO/WP.38 (14 June 2017), at para. 9.

⁹³ *Comments and Notes on the Treaty Draft Text in View of the Second Session of Negotiations at United Nations*, Prepared by ICAN (Italy), UN Doc. A/CONF.229/2017/NGO/WP.47 (27 June 2017), at para. 14.

⁹⁴ “Articles 6–8, Papers by the Facilitators” *United Nations Conference to Negotiate a Legally Binding Instrument to Prohibit Nuclear Weapons, Leading Towards Their Total Elimination* (30 June 2017), online: UN Conference Website <<https://s3.amazonaws.com/unoda-web/wp-content/uploads/2017/06/Articles-6-8-30-June-30.pdf>>.

This language was ultimately incorporated into the 3 July 2017 draft text by President Whyte Gómez,⁹⁵ reflecting closely the recommended text by the International Committee of the Red Cross in imposing primary responsibility for environmental remediation on the affected territorial state, as opposed to the state that had used or tested nuclear weapons and thus caused the harm⁹⁶ – despite the fact that the so-called “polluter pays” approach endorsed by numerous delegations, including, among others, Sweden, Cuba, Thailand, Venezuela, and Vietnam.⁹⁷ Again, however, this amended language provided little guidance in clarifying the meaning and overall scope of the phrase “activities related to the use or testing of nuclear weapons”.

On 5 July 2017, during the final stages of the negotiations and following the submission of the above agreed upon revisions to Article 6 facilitated by Ambassador Labbé, the Kazakhstani delegation suggested adopting the phrase “past activities associated with the development, production, storage of nuclear weapons or other nuclear explosive devices, for instance uranium tailings” within Article 6 generally.⁹⁸ This represented a clear, last-ditch attempt to explicitly expand the range of nuclear weapons-related activities that would fall under Article 6, though this last-minute recommended adjustment received no additional explicit support from other state participants as the 2017 Conference drew to a close. On the one hand, the absence of express support for the broader range of activities proposed by Kazakhstan (and other participants) could indicate that most state delegations endorsed the view that the nuclear weapons-related activities covered by Article 6(2) should be narrowly construed to testing and use only. On the other hand, however, the decision to retain the phrase “activities related to...” may simply imply that most participating states viewed this language as potentially broad, or flexible enough to go beyond environmental damage contamination stemming only from the testing and use of nuclear weapons. Quite simply, the general silence on this issue among participating states during the 2017 Conference can be interpreted both ways and should, therefore, not be relied upon too far.

But, perhaps, even more significantly, one of the reasons Kazakhstan’s suggestion received little attention on 5 July 2017 concerned timing. Quite simply, there was insufficient mandated time towards the end of the 2017 Conference for participating states to delve into this question in any depth. Instead, other issues concerning Article 6 took priority and required more urgent discussion among the participants, notably disagreement on the primary or fundamental responsibility of user states for implementing the positive obligations. Accordingly, the scope of activities captured by Article 6(2) remained unaddressed towards the final sessions of the 2017 Conference in July, resulting in the ambiguity presented in this article.

C. Summary of Treaty Interpretation

Overall, the *travaux préparatoires* of the TPNW, again, do not seem to remedy or clarify the nature of the scope of activities covered under Article 6(2) in light of the existing ambiguity presented by the ordinary meaning of obligation established reached above. Indeed, the phrase “activities related to the testing and use of nuclear weapons” remained

⁹⁵ *Second Revised Draft Treaty on the Prohibition of Nuclear Weapons*, UN Doc. A/CONF.229/2017/L.3 (3 July 2017).

⁹⁶ Comments of the International Committee of the Red Cross on Key Provisions of the Draft Convention on the Prohibition of Nuclear Weapons, *supra* note 89 at 6.

⁹⁷ Stuart CASEY-MASLEN, *The Treaty on the Prohibition of Nuclear Weapons: A Commentary* (Oxford: Oxford University Press, 2019) at 209.

⁹⁸ “Audiovisual Records, 26th Meeting” *United Nations Conference to Negotiate a Legally Binding Instrument to Prohibit Nuclear Weapons, Leading Towards Their Total Elimination* (5 July 2017), online: UN WebCast <<https://media.un.org/en/asset/k1y/k1y8biadz8>> at 16:30–16:48.

unaltered from its initial incorporation into the 22 May 2017 draft until the adoption of the final text on 7 July 2017 – though Article 6(2) was amended to establish a stronger legal obligation on affected states to take “necessary and appropriate measures” towards environmental remediation. Consequently, the conclusions reached were based upon the ordinary language of the text above pursuant to Article 31 of the VCLT, and that the scope of activities encompassed by the phrase “activities related to the testing and use of nuclear weapons” within Article 6(2) could be interpreted in either a narrow or broad sense still stands.

III. POLICY AND PRACTICAL CONSIDERATIONS BOTH AGAINST AND IN FAVOUR OF A BROAD INTERPRETATION OF ACTIVITIES CAPTURED BY ARTICLE 6(2)

Having illustrated the uncertainty surrounding the interpretation of activities captured by Article 6(2), created by the phrase “activities related to the testing and use of nuclear weapons”, and consolidated by the absence of positions among states themselves during the 2017 Conference, the following Part outlines some policy or practical considerations that the TPNW parties may need to bear in mind when advancing positions *vis-à-vis* the broad and narrow approaches to Article 6(2).⁹⁹ This discussion is not intended to represent a comprehensive assessment of all pragmatic and technical considerations that may require consideration by states; rather, it tries to paint a picture of the complexity of the issue at hand. Accordingly, the following Part frames these considerations as arguments “against” and “in favour” of a broad interpretation of activities covered by Article 6(2), though the conclusions reached will logically allude to the possible benefits and pitfalls of a narrow interpretation, as well as through implication.

A. Practical Considerations Against a Broad Interpretation of Article 6(2)

To begin, there are some reasons why a broad interpretation of activities covered by Article 6(2) may not be supported by the TPNW parties, or should be cautioned against generally. First, it must be emphasized that throughout the 2017 negotiations and the wider history of the TPNW process during the “Humanitarian Initiative”, including the three Humanitarian Conferences held in Oslo, Nayarit, and Vienna between March 2013 and December 2014, the majority of academic, scientific, and state presentations and statements, examining the environmental consequences of nuclear weapons, focused predominantly on the devastating legacy of past nuclear weapons testing and use for the environment,¹⁰⁰ alongside the probable environmental and climatic consequences of any future detonation of nuclear weapons.¹⁰¹ Accordingly, a narrow interpretation of

⁹⁹ See also in this regard Docherty, *supra* note 19; IHRC, “Environmental Remediation in the Nuclear Weapon Ban Treaty: A Comprehensive and Detailed Approach” *Article 36 and the International Human Rights Clinic* (June 2017), online: Article 36 <<https://article36.org/wp-content/uploads/2017/06/ER-ban-treaty-full-1.pdf>>.

¹⁰⁰ A collection of the statements and presentations delivered by participants can be found at Reaching Critical Will, “Humanitarian Impact of Nuclear Weapons”, online: Reaching Critical Will <<https://www.reaching-criticalwill.org/disarmament-fora/hinw>>.

¹⁰¹ See e.g. Ira HELFAND, “The Wider Impact: Long Term Effects on Health, Environment and Development” *Oslo Conference on the Humanitarian Impact of Nuclear Weapons* (4 March 2013), online: *Regjeringen* <https://www.regjeringen.no/globalassets/upload/ud/vedlegg/hum/hum_helfand.pdf>; Michael J MILLS, Alan Robock, Owen B. TOON, Lili XIA, Andrea STENKE, and Ira HELFAND, “Global Famine after a Regional Nuclear War: Overview of Recent Research” *Vienna Conference on the Humanitarian Impact of Nuclear Weapons* (8–9 December 2014), online: Reaching Critical Will <http://www.reachingcriticalwill.org/images/documents/Disarmament-fora/vienna-2014/8Dec_Mills.pdf>. Although see Arjun MAKHIJANI, “Assessing the Harm from Nuclear Weapons Testing and Production” *Vienna*

Article 6(2) would align with how environmental damage was presented throughout the TPNW negotiation process, primarily in relation to the testing and use of nuclear weapons rather than additional activities. This observation does not seek to refute the importance of addressing the often vast environmental harm resulting from other nuclear weapons-related activities but, rather, acknowledges the fact that within the wider TPNW process, environmental damage was contextualized primarily in relation to the testing and use of nuclear weapons.¹⁰²

Second, there may have been a concern that certain states could become overburdened by the obligation imposed by Article 6(2) if a broader scope of activities was ultimately endorsed. Indeed, it is well established that Article 6 imposes primary responsibility on “affected” states parties to implement victim assistance and environmental remediation, while envisaging a sense of collective responsibility to assist with such activities under Article 7.¹⁰³ Although this can and has been justified,¹⁰⁴ there remains a risk that some affected states could be overwhelmed by the obligations under Article 6,¹⁰⁵ particularly if the phrase “activities related to testing or use of nuclear weapons” within by Article 6(2) is interpreted broadly. To take one (somewhat “extreme” or unique) example, a state such as Kazakhstan – already heavily affected by former Soviet testing during the Cold War – would be required to extend its remediation efforts to cover its extensive uranium mining activities (as the world’s largest producer and exporter of uranium),¹⁰⁶ not to mention addressing other possible sources of contamination from the storage of nuclear weapons on Kazakh territory by the former Soviet Union.¹⁰⁷ Simply put, Kazakhstan would be “doubly” affected by a broader interpretation of activities included within Article 6(2). This concern would be exacerbated further still if a particular affected state party lacks sufficient personnel, technical, or financial resources to implement Article 6(2) successfully under a broad interpretation.

Finally and relatedly, a broader interpretation could give rise to complex practical and operational questions when implementing Article 6(2). For example, if a broad approach is favoured, a question would arise as to precisely how affected TPNW parties should prioritize the different types of environmental damage that may exist within their territory or jurisdiction. Should the TPNW parties address environmental damage from the testing and use of nuclear weapons and other nuclear weapons-related activities and should

Conference on the Humanitarian Impact of Nuclear Weapons (8–9 December 2014), online: Reaching Critical Will <https://www.reachingcriticalwill.org/images/documents/Disarmament-fora/vienna-2014/8Dec_Makhijani.pdf>.

¹⁰² However, as will be discussed in Part III.B, a broad interpretation that address additional forms of harms could nonetheless conform with the humanitarian purpose of the TPNW.

¹⁰³ See e.g. IHRC, “Victim Assistance and Environmental Remediation in the Treaty on the Prohibition of Nuclear Weapons: Myths and Realities” *Human Rights Programme - Harvard* (April 2019), online: Harvard Law School <https://hrp.law.harvard.edu/wp-content/uploads/2019/05/TPNW_Myths_Realities_April2019.pdf> at 4.

¹⁰⁴ IHRC, “Environmental Remediation under the Treaty on the Prohibition of Nuclear Weapons” *Human Rights Programme - Harvard* (April 2018), online: Harvard Law School <<http://hrp.law.harvard.edu/wp-content/uploads/2018/04/Environmental-Remediation-short-5-17-18-final.pdf>> at 2.

¹⁰⁵ Rietiker argues that the imposition of primary responsibility for victim assistance on the affected state is “regrettable” and could lead to the position in which states “affected by testing of nuclear weapons might not be in a position to fulfil their obligations under Article 6(1)”, a point that could logically extend to environmental remediation under Article 6(2) as well: see Daniel RIETIKER, “New Hope for Nuclear Disarmament or ‘Much Ado About Nothing?’ Legal Assessment of the new ‘Treaty on the Prohibition of Nuclear Weapons’ and the Joint Statement by the USA, UK, and France Following its Adoption” (2017) 59 *Harvard International Law Journal Online* 22 at 29.

¹⁰⁶ “Kazakhstan: Nuclear Overview” *Nuclear Threat Initiative* (23 April 2018), online: Nuclear Threat Initiative <<https://www.nti.org/analysis/articles/kazakhstan-nuclear/>>.

¹⁰⁷ As will be conceded, however, such concerns of overburdening or structuring environmental remediation efforts to an extended range of harms should not be overstated, see Part III.B.

the source of environmental harm be captured under a broad interpretation simultaneously? If so, could this run the risk of overstressing an affected state's (often limited) resources to a number of sources of environmental contamination? Or, alternatively, to mitigate concerns about overburdening and the availability of resources among states with more limited personnel, technical, or financial capacities,¹⁰⁸ should a "stepped" approach to implementing Article 6(2) be advanced whereby contamination from past testing and the use of nuclear weapons is addressed as a matter of priority by affected states (with the cooperation of non-affected states parties under Article 7(3)),¹⁰⁹ before attention then turns to address other sources of environmental damage such as uranium mining and fissile material reprocessing accidents? Although a "stepped" approach to Article 6(2) under a broad interpretation may prove to be a pragmatic solution by introducing a process of prioritization, this could unintentionally run the risk of creating an implied "hierarchy" of environmental harms, whereby the damage and contamination from nuclear weapons testing and use is afforded greater consideration over other, and often equally devastating, forms of environmental damage from the connected nuclear weapons-related activities described above.¹¹⁰

These are certainly challenging operational questions that this paper does not seek to address fully. Rather, the underlying point is that a broader interpretation could potentially introduce operational challenges, and questions that may unduly impact the implementation of Article 6(2) by affected states. Accordingly, if a broader interpretation is accepted among the TPNW parties, further elaboration as to precisely how the implementation of Article 6(2) would or should proceed in practice shall be required.

B. Practical Considerations in Favour of a Broad Interpretation

Despite the above concerns, there are a number of equally compelling reasons and appeal to employ a broad interpretation of the scope of activities captured by Article 6(2), given the potentially wide-ranging benefits for affected communities and environments that could arise through subsequent implementation of the provision. First, given that remediation involves "measures that may be carried out to reduce the radiation exposure from existing contamination of land areas through actions applied to the contamination itself (the source) or to the exposure pathways to humans",¹¹¹ there is a clear human-centred objective and purpose inherent to environmental remediation in the TPNW.¹¹² Accordingly, although environmental damage from nuclear weapons was principally contextualized in relation to testing and use during the TPNW's wider history,¹¹³ incorporating additional activities beyond nuclear weapon testing and use under a broad interpretation of Article 6(2) would align with the TPNW's underlying object and purpose¹¹⁴ as an instrument of "Humanitarian Disarmament", which "focuses on preventing

¹⁰⁸ See above.

¹⁰⁹ TPNW, *supra* note 1, art. 7, which envisages international cooperation and assistance in relation to the implementation of the treaty as a whole.

¹¹⁰ See Part I.

¹¹¹ IAEA, "Policy and Strategies for Environmental Remediation" *IAEA Nuclear Energy Series No NW-G-3.1* (2015), online: IAEA Publications <https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1658_web.pdf> at 28.

¹¹² Of course, environmental remediation activities under Article 6(2) of the TPNW also have the potential to significantly benefit the environment itself, see Environmental Remediation under the Treaty on the Prohibition of Nuclear Weapons, *supra* note 104.

¹¹³ See Part III.A.

¹¹⁴ Recall that in treaty interpretation, the ordinary meaning of a treaty's text should be interpreted in light of the object and purpose of the treaty, *VCLT*, *supra* note 21, art. 31(1).

and remediating human suffering and environmental harm” caused by problematic weapons.¹¹⁵

Second, it should also be noted that standards of best practice to assist with the remediation of nuclear or radioactive contaminated areas following uranium mining, nuclear accidents, and other nuclear weapons-related forms of environmental harms have been developed by the International Atomic Energy Agency,¹¹⁶ the World Nuclear Association,¹¹⁷ and joint programmes by the NEA and the OECD.¹¹⁸ Although these represent non-binding guidelines and thus constitute “soft” principles rather than legal commitments,¹¹⁹ this illustrates that frameworks and structures already exist to address a broader range of environmental harms, from nuclear weapons-related activities beyond the testing and use of nuclear weapons. Accordingly, affected states parties would not be starting from a blank slate, but could use existing frameworks, guidance, and practices to address a broad range of nuclear weapons-related environmental harms if additional activities are caught by Article 6(2). In fact, the TPNW parties could even develop such informal, “soft” standards into binding legal obligations within the framework of the TPNW through decisions with future institutional settings pursuant to Article 8.¹²⁰

Moreover, although it has been suggested that endorsing a broad interpretation could create a “hierarchy” of harms between different types of environmental damage caused by different nuclear weapons-related activities,¹²¹ a similar concern could nonetheless arise under a narrow approach. Put simply, if states ultimately endorse a limited reading of activities captured under Article 6(2), this limitation of remediation activities to *only* environmental damage and contamination stemming from the testing and use of nuclear weapons would itself inadvertently create a hierarchy of sorts. Indeed, such a decision would illustrate a conscious choice to prioritize harm from nuclear weapon testing and use, even if the environmental harm from other nuclear weapons-related activities may be significantly more extensive or widespread in some cases.¹²² Accordingly, it may be that, regardless of whether a broad or narrow interpretation is ultimately endorsed, some form of hierarchy of environmental harms may arise.¹²³

¹¹⁵ “Home” *Humanitarian Disarmament: Seeking to Prevent and Remediate Arms-Inflicted Human Suffering and Environmental Harm*, online: Humanitarian Disarmament <<https://humanitariandisarmament.org/>>. For an excellent history of the notion of humanitarian disarmament, see Treasa DUNWORTH, *Humanitarian Disarmament: An Historical Enquiry* (Cambridge: Cambridge University Press, 2020); Bonnie DOCHERTY, “Ending Civilian Suffering: The Purpose, Provisions and Promise of Humanitarian Disarmament Law” (2010) 15 *Austrian Review of International and European Law* 7.

¹¹⁶ IAEA, “Guidebook on the Development of Regulations for Uranium Deposit Development and Production” IAEA-TECDOC-862 (1996), online: IAEA INIS Repository Search <https://inis.iaea.org/collection/NCLCollectionStore/_Public/27/060/27060403.pdf>; IAEA, “Best Practice in Environmental Management of Uranium Mining” IAEA Nuclear Energy Series, No. NF-T.1.2 (2010), online: IAEA Publications <https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1406_web.pdf>.

¹¹⁷ “Sustaining Global Best Practices in Uranium Mining and Processing: Principles for Managing Radiation, Health and Safety, Waste and the Environment” *World Nuclear Association*, online: World Nuclear Association <<https://www.world-nuclear.org/our-association/publications/technical-position-papers/best-practice-in-uranium-mining.aspx>>.

¹¹⁸ Managing Environmental and Health Impacts of Uranium Mining, *supra* note 32.

¹¹⁹ See usefully Alan BOYLE, “The Choice of a Treaty: Hard Law versus Soft Law” in Simon CHESTERMAN, David M. MALONE, and Santiago VILLAPANDO, eds., *The Oxford Handbook of United Nations Treaties* (New York: Oxford University Press, 2019), 101.

¹²⁰ TPNW, *supra* note 1, art. 8.

¹²¹ Part III.A.

¹²² As discussed in Part I.

¹²³ In which case, such concerns should balance each other out, and not act as a decisive factor as to whether a broad or narrow interpretation of Article 6(2) is ultimately endorsed.

Additionally, it must be recognized that concerns about overburdening “doubly” affected states parties should not be overstated. Although some states, such as Kazakhstan, have been subjected to a number of nuclear weapons-related activities,¹²⁴ including uranium mining, testing, storage, and so forth, many other states may have only previously experienced a single, specific type of harm. For example, among current TPNW parties where uranium mining is particularly widespread, such as Namibia and signatories like Niger and Malawi, no other significant “activities relating to the use or testing of nuclear weapons” have previously taken place. Similarly, many other states that have been subjected to nuclear weapons testing, such as the Marshall Islands, Algeria, and Kiribati, do not have a history or extensive experience of uranium mining or fissile material production (and are, therefore, not as overburdened as Kazakhstan). While this observation certainly does not seek to downplay the challenges posed by remediating former nuclear testing sites within these states, it does indicate that resources will not always be overly stretched in every single case if a broader interpretation of activities captured by Article 6(2) is endorsed by states. Accordingly, aforementioned concerns of overburdening affected states parties by incorporating a broad interpretation of Article 6(2) should not be exaggerated; they may only present an issue in a few, exceptional cases.

Furthermore, it is telling that many nuclear weapon possessing states (e.g. the US, Russia, and China) and certain military allied states (e.g. Australia) have experienced both nuclear testing and mining activities within their territories and are, therefore, also “doubly” affected. Although these states are unlikely to ratify the TPNW in the near future,¹²⁵ they each possess significantly larger economic infrastructures and material capacities that would likely be able to cope with the more onerous demands posed by an extended interpretation of Article 6(2), should they ever accede to the Treaty.¹²⁶

Finally, it is interesting to note that while Kazakhstan would be “doubly” affected by a broader interpretation of Article 6(2), it has, nevertheless, remained one of the few states that expressly called for a broader range of nuclear weapons-related activities to be included under the environmental remediation provisions of the TPNW at the 2017 Conference.¹²⁷ This would suggest that Kazakhstan itself is less concerned with the possibility of becoming overburdened if Article 6(2) is extended in the manner described by offering explicit support for such a broad interpretation of activities covered. Indeed, Kazakhstan has a relatively large economy, fuelled in part by its uranium mining exports.¹²⁸ Accordingly, the concern that Kazakhstan would, in practice, be overburdened by a broad interpretation of activities caught by Article 6(2) can itself be challenged.

C. Summary

Clearly, therefore, there are legitimate policy and pragmatic arguments both in favour and against expanding the scope of activities caught by Article 6(2). For want of repetition, the purpose of this Part is to merely illustrate the complexity of what is at stake behind this

¹²⁴ See Part III.A.

¹²⁵ Given their continued opposition to the treaty in multilateral discourse, see e.g. P5 Joint Statement on the Treaty on the Non-Proliferation of Nuclear Weapons, *supra* note 12; and among NWPS allies within NATO, see “Brussels Summit Communiqué, issued by the Heads of State and Government participating in the meeting of the North Atlantic Council in Brussels” *North Atlantic Treaty Organization* (NATO) (14 June 2021), online: NATO <https://www.nato.int/cps/en/natohq/news_185000.htm> at para. 47.

¹²⁶ “GDP (Current US\$): 2020” *World Bank* (2020), online: World Bank <<https://data.worldbank.org/indicator/NY.GDP.MKTP.CD>> [World Bank].

¹²⁷ Part III.B.

¹²⁸ World Bank, *supra* note 126, which states that Kazakhstan’s economy measures approximately \$171.082 billion.

discussion generally. With this in mind, the TPNW parties should, therefore, exercise caution before jumping to endorse a broad interpretation, and consider the potential advantages of accepting a more modest, narrow interpretation that does not unrealistically *unextend* often limited resources in order to focus exclusively on addressing harms from the testing and use of nuclear weapons.

IV. CONCLUDING THOUGHTS – WHERE NEXT?

Given the inconclusiveness of the interpretation of the scope of activities captured by Article 6(2) through an application of the rules of treaty interpretation under international law, coupled with the discussed policy considerations both for and against a broad interpretation of Article 6(2), this final Part discusses what next steps should be pursued in order to resolve the ambiguity presented within this article.

Quite simply, it is recommended that TPNW parties should begin to discuss and advance positions on the scope of activities captured by the obligation to remediate contaminated environments under Article 6(2) – whether that is in support of either the broad or narrow approaches already discussed. Indeed, because it is states parties to the TPNW that are ultimately under the obligation to implement environmental remediation to contaminated areas within their jurisdiction or control (or in the case of non-affected states parties to provide international assistance and cooperation to affected states parties towards this end under Article 7),¹²⁹ it is necessary that some clarification on the range of nuclear weapons-related activities covered by Article 6(2) is made by states parties themselves as implementation of the TPNW begins.

Future institutional meetings of the TPNW, established pursuant to Article 8, notably the “meetings of states parties” under paragraph 1, may provide states parties and civil society with an opportunity to advance positions on this matter more comprehensively. Under Article 8(1):

The States Parties shall meet regularly in order to consider and, where necessary, take decisions in respect of *any matter with regard to the application or implementation of this Treaty*, in accordance with its relevant provisions, and on further measures for nuclear disarmament, including:

- (a) The implementation and status of this Treaty;
- (b) Measures for the verified, time-bound and irreversible elimination of nuclear-weapon programmes, including additional protocols to this Treaty;
- (c) Any other matters pursuant to and consistent with the provisions of this Treaty. (emphasis added)

While Article 8(1) identifies explicitly some areas that may be subject to discussion, this is done in a non-exhaustive fashion.¹³⁰ Consequently, the scope of issues that could be discussed during meetings of state parties of the TPNW is wide ranging,¹³¹ meaning that virtually any issue or matter can be discussed, provided that it is “pursuant to and consistent with the provisions” of the TPNW – including, for present purposes, clarifying the scope of activities caught by Article 6(2). Accordingly, the meetings of states parties,

¹²⁹ See specifically TPNW, *supra* note 1, art. 7(3).

¹³⁰ Stuart CASEY-MASLEN and Tobias VESTNER, “Trends in Global Disarmament Treaties” (2020) 25 *Journal of Conflict and Security Law* 449 at 462–3.

¹³¹ Casey-Maslen, *supra* note 97 at 226.

and for that matter the review conferences established under Article 8(4), would provide a suitable platform through which discussion of Article 6(2), including whether activities beyond testing and use are captured by the provision, can take place.

Additionally, based on recommendations from civil society,¹³² the TPNW parties attending the 1MSP in Vienna have now established intersessional informal “working groups” mandated to discuss and examine the practical challenges and other facets of the positive obligations of the Treaty, including environmental remediation under Article 6(2), in greater detail.¹³³ These future working groups on Articles 6 and 7 of the TPNW may provide a suitable and specifically designed setting whereby TPNW parties, other international organizations, and civil society partners can advance their respective views as to whether the phrase “activities related to the use or testing of nuclear weapons” under Article 6(2) should be interpreted narrowly or broadly. Such sessions could also reach some form of agreement as to the coverage of environmental remediation efforts under the TPNW among participants too.

The TPNW parties would also have a number of solutions or approaches through which this clarification of the scope of activities covered under Article 6(2) could take place, after further consideration and elaboration within the institutional framework of the TPNW. First, if parties reach a general agreement on the scope of Article 6(2) in future discussions, a formal amendment to Article 6(2) that clearly specifies the scope of activities covered in greater detail, whether narrowly or broadly construed, could be proposed by a state party and sent to the UN Secretary-General, subject to the process established by Article 10 of the TPNW.¹³⁴ This would require support from a majority of parties who, within ninety days of receipt, could further consider the amendment at a subsequent meeting of states parties or at a review conference, whichever comes first.¹³⁵ Additionally, if the amendment is considered, the proposed amendment would require a two-thirds majority vote in favour at the meeting of states parties or review conference in order to be approved,¹³⁶ and would require further formal acceptance of such an amendment by a majority of the TPNW members individually to take effect.¹³⁷

However, the practical operation of amendments under international treaty law is notoriously complicated.¹³⁸ Indeed, even if a majority of the TPNW parties were to formally accept the amended language that supports either the broad or narrow interpretation of Article 6(2), ultimately endorsed by the majority of parties, this would not automatically bind those states parties to the TPNW who chose not to ratify or accept the amendment.¹³⁹ Accordingly, the possible adoption of any amendment that clarifies the scope of activities to which remediation measures would apply pursuant to the

¹³² See e.g. IHRC, “Implementing Environmental Remediation under the Treaty on the Prohibition of Nuclear Weapons” *Human Rights Programme - Harvard* (July 2021), online: Harvard Law School <http://hrp.law.harvard.edu/wp-content/uploads/2021/07/TPNW-ER-factsheet_7-21.pdf>; Docherty, *supra* note 19; and the discussions during “Panel Discussion 1: National Implementation, Victim Assistance and Environmental Remediation, Implementation of the Treaty on the Prohibition of Nuclear Weapons” *United Nations Institute for Disarmament Research* (UNIDIR) (18 January 2021), online: UNIDIR <<https://unidir.org/events/implementation-treaty-prohibition-nuclear-weapons>>.

¹³³ *Draft Vienna Action Plan, TPNW/MSP/2022/CRP.7* (22 June 2022) at 4–5; *Decisions to be taken by the first Meeting of States Parties to the Treaty on the Prohibition of Nuclear Weapons, TPNW/MSP/2022/CRP.6* (22 June 2022) at 2–4.

¹³⁴ See generally TPNW, *supra* note 1, art. 1; and useful commentary by Casey-Maslen, *supra* note 97 at 234–7.

¹³⁵ TPNW, *supra* note 1, art. 10(1).

¹³⁶ *Ibid.*, art 10(2).

¹³⁷ *Ibid.*, art 10(3).

¹³⁸ See Aust, *supra* note 57 at 232–44; Jan KLABBERS, “Treaties, Amendment and Revision” (2006) *Max Planck Encyclopaedia of International Law*.

¹³⁹ Klabbbers, *supra* note 138 at paras. 7–8.

process established by Article 10 could give rise to “two parallel regimes”.¹⁴⁰ The first, reflecting the new, modified framework binding states parties that accept the amendment clarifying the scope of Article 6(2) (be that broadly or narrowly); the second, reflecting the original, ambiguous phrasing of Article 6(2) that would bind states that reject the amendment *vis-à-vis* other TPNW parties.¹⁴¹

Alternatively, it is possible, pursuant to Article 8, that the TPNW parties could adopt an interpretative “decision” on the scope the activities covered by Article 6(2), as this would clearly constitute a “matter with regard to the application or implementation” of the TPNW.¹⁴² Likewise, an informal or political declaration, or guidelines, could be reached among the participating TPNW parties with the aim of elucidating the meaning of Article 6(2) with greater clarity. Voting on such a decision would be based upon the rules of procedure to be adopted for subsequent meetings of states parties as decided at 1MSP in June 2022.¹⁴³ Such a decision, adopted in the context of a conference or meeting of TPNW parties, could amount to a “subsequent agreement” among TPNW parties regarding the interpretation of the Treaty or the application of its provisions pursuant to Article 31(3)(a) of the VCLT, depending upon its final content, amounting to an “authoritative interpretation” and common agreement on the scope of activities caught by the environmental remediation commitments of the TPNW.¹⁴⁴

The ILC has recently provided a number of “Draft Conclusions” on subsequent agreements and practice in the context of treaty interpretation, indicating in Conclusion 6(2) that subsequent agreement “may take a variety of forms”.¹⁴⁵ Such a subsequent agreement may result in “narrowing, widening, or otherwise determining the range of possible interpretations” of a treaty’s provisions,¹⁴⁶ outcomes that would help provide the desired clarity on the scope of Article 6(2) called for by this article. Furthermore, the ILC also confirmed in Conclusion 11 that decisions adopted in the context of a “Conference of States Parties” represent a firm example of subsequent agreement, provided that it expresses clear agreement in substance among the states parties. As the commentary to this Conclusion observes, such agreements on interpretation have been regularly adopted in the context of the Biological Weapons Convention of 1972.¹⁴⁷ With this in mind, any subsequent agreement on the scope of Article 6(2) would only be compelling from an interpretative point of view if it offered sufficient clarity and precision and was adopted unanimously by TPNW parties,¹⁴⁸ though it could nonetheless prove useful in practical terms in operationalizing the TPNW if endorsed by a super-majority of states – including those parties with environments impacted by nuclear weapons-related activities.

In the end, precisely what form of agreement is reached by TPNW parties on this issue is not necessarily the most pressing. Rather, more fundamentally, the point is that discussions and clarifications as to the precise scope of the activities covered by Article 6(2) to

¹⁴⁰ As noted by Rietiker and Mohr, *supra* note 20 at 32.

¹⁴¹ This, in effect, represents the solution proposed by the VCLT, *supra* note 21, art 40(4).

¹⁴² TPNW, *supra* note 1, art 8(1).

¹⁴³ Pursuant to art 8(2), the 1MSP employed the rules of procedure used during the 2017 Conference, see *Rules of Procedure of the United Nations Conference to Negotiate a Legally Binding Instrument to Prohibit Nuclear Weapons, Leading Towards their Total Elimination*, UN Doc. A/CONF.229/2017/5 (13 June 2017).

¹⁴⁴ See usefully Aust, *supra* note 57 at 212–14.

¹⁴⁵ *Subsequent Agreements and Subsequent Practice in Relation to the Interpretation of Treaties*, Report of the International Law Commission on the Work of its Seventieth Session, UN Doc. A/73/10 (2018), at 11, Conclusion 6(2) [*Subsequent Agreements and Practice*].

¹⁴⁶ *Ibid.*, Conclusion 7(1).

¹⁴⁷ *Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction*, 10 April 1972, 1015 U.N.T.S. 163 (entered into force 26 March 1975).

¹⁴⁸ *Subsequent Agreements and Practice*, *supra* note 145 at 90, Conclusion 11.

address the ambiguity and lack of elaboration of the scope of the phrase “activities related to the testing and use of nuclear weapons” should have been pursued in earnest among TPNW parties during the 2017 Conference. Such discussions may take a considerable time and may not be of immediate (or apparent) relevance to TPNW parties, but they will ultimately prove essential in addressing the ambiguity and lack of elaboration by states of the scope of the phrase “activities related to the testing and use of nuclear weapons” under Article 6(2).

Overall, it is hoped that by revealing the source of this uncertainty in relation to Article 6(2) from a treaty interpretation point of view, and by highlighting certain policy and pragmatic considerations both endorsing and cautioning against an expanded interpretation, this paper can encourage and contribute to further discussions surrounding the extent of nuclear weapons-related activities that are caught by the phrase “activities related to the testing and use of nuclear weapons”.

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