

INTERNATIONAL COURT OF JUSTICE

DISPUTE OVER THE STATUS AND USE OF THE
WATERS OF THE SILALA

(CHILE v. BOLIVIA)

**REJOINDER OF THE
PLURINATIONAL STATE OF BOLIVIA**

VOLUME 1 OF 6

15 MAY 2019

**REJOINDER
OF THE PLURINATIONAL STATE OF BOLIVIA**

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CHAPTER 1

INTRODUCTION

1. On 6 June 2016 Chile filed its Application concerning the *Dispute over the Status and Use of the Waters of the Silala* to the Court and submitted its Memorial on 3 July 2017. Bolivia submitted its Counter-Memorial and Counter-Claims on 3 September 2018, and Chile its Reply on 15 February 2019. This Rejoinder is submitted on 15 May 2019 in accordance with the Order of the Court dated 15 November 2018.

A. The Order of the Court and Chile's Change of Position

2. The Order of the Court directing the submission of a Reply and a Rejoinder expressly limited these written submissions “to the Respondent’s counter-claims”¹. The decision was adopted after the President of the Court ascertained, in accordance with Article 31 of the Rules of Court, the views of the Parties, and following a meeting held by the President of the Court with the Agents of the Parties on 17 October 2018.

¹ Order of the Court dated 15 November 2018, fixing time-limits for the Reply and the Rejoinder, p. 3. Bolivia’s counter-claims are the following:

“a) Bolivia has sovereignty over the artificial channels and drainage mechanisms in the Silala that are located in its territory and has the right to decide whether and how to maintain them; b) Bolivia has sovereignty over the artificial flow of Silala waters engineered, enhanced, or produced in its territory and Chile has no right to that artificial flow; c) Any delivery from Bolivia to Chile of artificially-flowing waters of the Silala, and the conditions and modalities thereof, including the compensation to be paid for said delivery, are subject to the conclusion of an agreement with Bolivia” (BCM, p. 106, Submissions, para 2).

3. In said Order, the Court made reference to Chile’s letter dated 9 October 2018. In this letter the Agent of Chile noted that “in order to expedite the procedure her Government would not contest the admissibility of the Counter-Claims contained in the Counter-Memorial of Bolivia”. It was further noted that:

“at a meeting held by the President of the Court with the Agents of the Parties on 17 October 2018, the Agent of Chile reiterated the fact that her Government did not intend to contest the admissibility of the counter-claims of Bolivia”².
4. In Chile’s opinion “a second round of written pleadings was not warranted because the legal arguments and evidence put forward by the Parties in their written pleadings –it assured– provided the Court with all the elements necessary to decide on the merits of the case”³. This position was further reiterated at a meeting held by the President of the Court with the Agents of the Parties on 17 October 2018.⁴
5. Notwithstanding this, by Note dated 5 November 2018, Chile requested Bolivia to submit digital data and documents referred to or relied on in Annex 17 and Annex 18 to the Counter-Memorial of Bolivia. According to Chile, “these data are indispensable for the proper analysis of the DHI report by Chile’s experts and should be readily available to DHI in digital format”⁵. On

² Note dated 9 October 2018 from the Agent of Chile cited in the Order of the Court dated 15 November 2018, p. 3.

³ Chile specified that “[t]his includes the alleged distinction introduced by Bolivia between ‘natural’ and ‘artificial’ flows and the alleged legal consequences thereof. It is thus considered unnecessary and inefficient, in terms of time and costs for both Parties, for the Court to order a second round of written pleadings.” Note dated 9 October 2018 from the Agent of Chile cited in the Order of the Court dated 15 November 2018, p. 3.

⁴ *Dispute over the Status and Use of the Waters of the Silala (Chile v. Bolivia)*, Order of 15 November 2018.

⁵ Letter from the Court 4 December 2018 (Ref. 151394) transmitting Note of the Agent of Chile dated 30 November 2018

29 March 2019, Bolivia noted that all the information requested by Chile, both referenced and non-referenced documents, was produced by Bolivia's experts and kindly provided to Chile as soon as it became available, including the necessary instructions to access them.⁶

6. Moreover, in its Reply, Chile submitted two new expert reports which, according to Chile, “provide additional data to support and/or refine the conclusions reached on their earlier experts reports submitted together with Chile’s Memorial (CM) of 3 July 2017”⁷. Chile also indicates in the Reply that these two new reports “are in turn supported by a number of underlying studies into the Silala River that are annexed to the Reply”⁸.
7. The submission of these materials confirms that, contrary to Chile’s assertions, there is a need to *look further at the facts*⁹ which are indeed *dispositive of the case*¹⁰. The complex reality of the Silala waters, and the factual and scientific material submitted by the Parties, requires the Court to consider carefully all the evidence. In keeping with its practice, the Court will

⁶ For the exchanges of Notes, *see* Letter from the Court dated 6 November 2018 (Ref. 151325) transmitting Note of the Agent of Chile dated 5 November 2018; Letter from the dated Court 4 December 2018 (Ref. 151394) transmitting Note of the Agent of Chile dated 30 November 2018; Letter from the Court dated 12 December 2018 (Ref. 151406) acknowledging receipt of Note of Bolivia dated 11 December 2018; Letter from the Court dated 27 December 2018 (Ref. 151443) transmitting Note of the Agent of Chile dated 21 December 2018; Letter from the Court dated 11 January 2019 (Ref. 151561) acknowledging receipt of Note of Bolivia dated 11 January 2019; Letter from the Court dated 8 February 2019 (Ref. 151593) acknowledging receipt of Note of Bolivia dated 7 February 2019; Letter from the Court dated 25 March 2019 (Ref. 151936) transmitting Note of the Agent of Chile dated 25 March 2019; and Letter from the Court dated 29 March 2019 (Ref. 152029) acknowledging receipt of Note of Bolivia dated 29 March 2019.

⁷ CR, para. 1.18.

⁸ CR, para. 1.18.

⁹ CR, para. 1.9.

¹⁰ CR, para. 1.17.

“make its own determination of the facts, on the basis of the totality of the evidence presented to it, and it will then apply the relevant rules of international law to those facts which it has found to be established”¹¹.

B. Bolivia’s Willingness to Engage in Joint Efforts Concerning the Silala Waters

8. As Bolivia stressed in its Counter-Memorial, the efforts by both Parties to identify the nature of the Silala waters has been a continuing process since 2000.¹² The present proceedings constitute another step in this ongoing process, demonstrated by the fact that both Bolivia and Chile are still expressing the need to commission and produce expert reports and studies. This Rejoinder is part of those efforts as well as the need to settle the present dispute.

9. Indeed, the settlement of the present dispute is important for international cooperation and good-neighbourliness. As Bolivia declared in June 2017 before the United Nations Security Council, “States have the obligation to manage, responsibly and in an integrated manner, water resources at all levels, including transboundary waters, under the principle of cooperation”¹³, and fresh water “must pave the way for opportunities that promote collaboration, interaction and harmony among peoples, not that spark conflicts surrounding its origin, ownership or use. Water jeopardizes peace

¹¹ *Certain Activities Carried Out by Nicaragua in the Border Area (Costa Rica v. Nicaragua)* and *Construction of a Road in Costa Rica along the San Juan River (Nicaragua v. Costa Rica)*, Judgment, I.C.J. Reports 2015, p. 726, paras. 175-176. See also *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, Judgment, I.C.J. Reports 2010, p. 72, para. 168.

¹² BCM, paras. 26-40.

¹³ United Nations, Security Council, 7959th meeting, 6 June 2017, S/PV.7959, p. 3.

and security among peoples; it must not be the cause of domestic or international conflicts”¹⁴.

10. The present proceedings confirm the need for the Parties to continue collaborating between them and pursue that objective. Bolivia has engaged, and is willing to continue engaging, in a constructive dialogue with the view to achieving a direct and friendly settlement.

C. Structure of the Rejoinder

11. The structure of the Rejoinder is as follows: Chapter 2 identifies the similarities arising from the scientific studies as a basis for agreements between the Parties. Chapter 3 deals with the points that require further clarifications from Chile. Depending on their content, these clarifications could bring the Parties closer in their understanding and eliminate the points of disagreement on the issues in question. Chapter 4 focuses on the remaining aspects of disagreement that still divide the Parties. Finally, Bolivia reiterates its Submissions related to its Counter-Claims. This Rejoinder is accompanied by 5 Volumes of Annexes, resuming at Annex 19 the numbering of the Bolivia’s Counter-Memorial.

¹⁴ United Nations, Security Council, 7959th meeting, 6 June 2017, S/PV.7959, p. 5.

CHAPTER 2

SIMILARITIES ARISING FROM SCIENTIFIC STUDIES AS A BASIS FOR AGREEMENTS BETWEEN THE PARTIES

12. In the Reply, Chile claims that the dispute has become “more limited” and “has been very significantly reduced as compared to when Chile decided to lodge its Application in June 2016”¹⁵. The fact that the Parties to a dispute may come to agreements during contentious proceedings is to be welcomed since the role of adjudication is to help States in settling their disputes. According to well-established jurisprudence of the Court, recourse to adjudication “is the final analysis [and] simply an alternative to direct and friendly settlement between the parties”¹⁶.
13. This Chapter aims at identifying those points of convergence concerning, first, the nature and legal regime applicable to the Silala waters (Section A) followed by the implications of Chile’s recognition of Bolivia’s sovereignty over the drainage mechanisms and channels (Section B) and, finally, the rights and obligations arising for the Parties as a result of the nature of Silala waters (Section C).

¹⁵ CR, paras. 1.3 and 1.16.

¹⁶ *Delimitation of the maritime boundary in the Gulf of Maine area, Judgment, I.C.J. Reports 1984*, p. 266, para. 22.

A. Silala Waters as a Complex System and the Applicability of Customary International Law

14. Based on the latest scientific findings, the experts consulted by both Parties have been able to conclude that the naturally occurring Silala flow follows the topographic gradient, crossing the border from Bolivia into Chile, and constitutes an international watercourse governed by customary international law.¹⁷ Both Parties agree that customary international law is applicable between the two States. Neither Bolivia nor Chile is a State Party to the 1997 UN Convention on the Law of the Non-Navigational Uses of International Watercourses (1997 Watercourses Convention).¹⁸

15. Experts of both Parties define the Silala as a complex system¹⁹, noting that its exact nature and functioning remain uncertain. Chile's expert reports indicate for instance that:

“the detail of the geology is highly complex [...] This means that the groundwater flow paths, the distribution of permeability and origins of recharge to different spring systems are also complex and not precisely known”.²⁰

B. Chile's Recognition of Bolivia's Sovereignty and Right to Dismantle the Artificial Drainage Mechanisms and Channels

16. The Parties agree that the installation of artificial waterworks in Bolivia consists of the excavation of earthen channels in the wetlands and the

¹⁷ BCM, paras. 44 and 110; CR, para. 1.3.

¹⁸ CM, para. 1.5; BCM, paras. 79, 153 and 171. Convention on the Law of the Non-Navigational Uses of International Watercourses, UN Doc A/RES/51/229 (1997).

¹⁹ CR, para. 3.11 (“complex nature of the Silala River and groundwater flow systems”).

²⁰ CR, Peach, D.W. and Wheeler, H.S. Concerning the Geology, Hydrogeology and Hydrochemistry of the Silala River Basin, 2019, p. 49. CR, Vol. 1, p. 215.

straightening and lining of the natural channel.²¹ Scientific studies conducted by both Parties also agree that the channelization has reduced the extent of surface water in Bolivian wetlands.²²

17. Chile does not contest “Bolivia’s sovereignty over artificial channels and drainage mechanisms located in its territory”²³ and, more broadly, it does not contest Bolivia’s Counter-Claim a), which refers to Bolivia’s “right to decide whether and how to maintain” these waterworks. Chile recognizes that Bolivia is entitled to such rights.²⁴
18. Experts of both Parties identified that the drainage works and the channelization of the Silala waters, which Bolivia describes in detail in the Counter-Memorial²⁵, have had, and continue to have, an effect on the increase of surface flows of Silala waters. According to Chile’s experts, “[b]oth we and Bolivia’s experts agree that the “[c]onstruction of drainage channels and river channelization in the 1920s will have had some effect on the flow [at the border]. An increase in flow due to these works is expected”²⁶.

C. Rights and Obligations of the Parties under Customary International Law

19. In order to identify the similarities in conclusions with respect to rights and obligations of the States, Bolivia will first deal with the principle of no

²¹ CR, para. 2.14; BCM, para. 49.

²² CR, para. 3.9.

²³ CR, para. 1.5.

²⁴ CR, para. 1.14.

²⁵ BCM, paras. 48-55.

²⁶ CR, Weather, H.S. and Peach, D.W. Impacts of Channelization of the Silala River in Bolivia on the Hydrology of the Silala River Basin, pp. 11 and 44. CR, Vol. 1, p. 140.

significant harm (Subsection 1) and then it will refer to the right of equitable and reasonable utilization (Subsection 2).

1. PRINCIPLE OF NO SIGNIFICANT HARM

20. Chile claims that the dispute has become more limited, in part, as a result of Bolivia's acknowledgment that "both riparian States have rights and obligations with respect to equitable and reasonable utilization of the Silala, prevention of significant harm, cooperation, timely notification of planned measures which may have a significant adverse effect, exchange of data and information and, where appropriate, the conduct of environmental impact assessments"²⁷. Bolivia agrees that these rules apply to the naturally-flowing waters of the Silala.
21. In the Counter-Memorial, Bolivia indicates, in particular, that "both Chile and Bolivia are each entitled to equitable and reasonable use "in relation to the naturally flowing waters of the Silala"²⁸. Both States have an "obligation to take all appropriate measures to prevent the causing of significant transboundary environmental harm in the Silala"²⁹. They also share an "obligation to cooperate and provide the other State with timely notification of planned measures which may have a significant adverse effect on naturally-flowing Silala waters, exchange data and information and conduct where appropriate environmental impact assessment"³⁰.

²⁷ CR, para. 1.3.

²⁸ BCM, para. 120.

²⁹ BCM, Submissions, para. 1 e).

³⁰ BCM, Submissions, para. 1 f).

22. Chile no longer claims that under international law the “no harm” principle applies to any kind of harm. In the Reply, Chile agrees with Bolivia that this principle only applies to “significant” transboundary environmental harm.³¹

2. RIGHT TO EQUITABLE AND REASONABLE UTILIZATION

23. The Parties agree that the Silala waters, at their current state, have been used only or exclusively by Chile thus far.³² Chile states in the Reply that “it does not claim to pre-empt any future uses by Bolivia of the Silala River”³³. Chile acknowledges that Bolivia possesses under international law the right to use the waters of the Silala. According to Chile, it “does not seek in any way to freeze further development and use of the waters so far as concerns either State”³⁴. Bolivia and Chile converge in determining that Bolivia has the right to use those waters “to the extent that such uses are consistent with the principle of equitable and reasonable utilization”³⁵.

³¹ CR, para. 2.39. Bolivia’s position is that “the ‘no significant harm’ principle applies under customary international law only to significant environmental harms and not, as Chile alleges in its Submissions, to “prevent and control pollution and other forms of harm” without qualifications.” BCM, para. 134.

³² CM, paras. 1.3 c) and 5.8.

³³ CR, para. 1.15.

³⁴ CM, para. 6.5.

³⁵ CR, para. 1.15.

CHAPTER 3

ASPECTS THAT REQUIRE CLARIFICATION BY CHILE

24. Chile agrees that Bolivia has the right under customary international law to use the waters of the Silala.³⁶ Chile also recognizes Bolivia's sovereignty over the drainage mechanisms and artificial channels within Bolivia's territory, as well as its sovereign right to dismantle them.³⁷ However, Chile's interpretation of those rights might result in a qualification of Bolivia's rights in a manner that might be equivocal and incompatible with international law.
25. This Chapter deals with two potential limitations to Bolivia's rights, namely Bolivia's right to use the waters of the Silala (Section A), and Bolivia's sovereignty over the artificial channels and its right to dismantle them (Section B). Finally, Bolivia notes the relevance of its Counter-Claim a) (Section C).

A. Clarifications Needed from Chile Concerning Bolivia's Right to Use the Waters of the Silala

26. Chile acknowledges that Bolivia has a right to use the waters of the Silala, but only "to the extent that such uses are consistent with the principle of equitable and reasonable utilization [...]", as well as other obligations under customary international law.³⁸ In addition, in the submissions of the Memorial, Chile asks the Court to declare that "[u]nder the standard of

³⁶ CR, para. 1.15.

³⁷ CR, paras. 1.8 (b), 1.14 and 1.15.

³⁸ CR, para. 1.15.

equitable and reasonable utilization, Chile is *entitled to its current use* of the waters of the Silala River”³⁹. Bolivia’s acceptance of this claim will depend on the meaning Chile ascribes to the phrase “entitled to its current use” in this context. Chile’s alleged entitlement to that use of Silala waters could be interpreted to relegate Bolivia’s right to use these waters to a secondary or subservient status.

27. The equitable and reasonable utilization of an international watercourse is an evolving and dynamic concept. The distribution of water and benefits must be reconsidered at any given moment in relation to any changes in the *existing* hydrologic, economic, social and other characteristics.⁴⁰ If Bolivia were to initiate its own use of the waters, that new use in conjunction with Chile’s existing use, would have to be taken into consideration and assessed (together with other relevant factors) by both States to determine their respective equitable and reasonable utilization rights *at that moment*.
28. The International Law Commission (ILC), in the preparatory work for the elaboration of the 1997 Watercourses Convention refers to the equitable utilization (together with equitable participation that complements the first) as one of the most fundamental rules of customary international law for international watercourses.⁴¹ The basic understanding of equitable and

³⁹ CM, Submission c) (emphasis added).

⁴⁰ S. McCaffrey, *The Law of International Watercourses*, Oxford University Press, 2007, at p. 388 (stating that the doctrine of equitable apportionment, from which the principle of equitable utilization emerges, “is ‘flexible’ [...] in a temporal sense: what is an ‘equitable apportionment’ may change over time”); and at p. 402 (asserting that, “Equitable utilization is not an abstract and static state of affairs, but one that must be arrived at through an ongoing comparison of the situations and uses of the states concerned”).

⁴¹ *Yearbook of the International Law Commission*, 1994, Vol. II, Part 2, pp. 96-97, para. 1 of the Commentary on Draft Article 5.

reasonable utilization entails both a right and obligation for States. As the ILC explains:

“[a] watercourse State has the right, within its territory, to a reasonable and equitable share, or portion, of the uses and benefits of an international watercourse. Thus a watercourse State has both the right to utilize an international watercourse in an equitable and reasonable manner and the obligation not to exceed its right to equitable utilization or, in somewhat different terms, not to deprive other watercourse States of their right to equitable utilization”⁴².

If Bolivia decides to dismantle the waterworks, Chile cannot make any claims based on its *current* flow. Chile cannot superimpose its rights to equitable and reasonable use over those corresponding to Bolivia.

29. If Chile clarifies that it agrees with Bolivia’s understanding, there would no longer be any issues dividing the Parties on Bolivia’s right to use the waters of the Silala.

30. In the application of the exercise of the right to equitable and reasonable use and participation, the ILC has considered situations in which States must consult with “*a spirit of cooperation*”, adding that “[e]xamples of situations giving rise to such a need include natural conditions, such as a reduction in the quantity of water [...]”⁴³. Bolivia is not obliged under international law to maintain the *current*, enhanced flow of the Silala. Nevertheless, in the spirit of good neighborliness and cooperation that must guide the Parties, Bolivia does not oppose the possibility to engage in dialogue and consultations with

⁴² *Yearbook of the International Law Commission*, 1994, Vol. II, Part 2, p. 97, para. 2 of the Commentary on Draft Article 5.

⁴³ *Yearbook of the International Law Commission*, 1994, Vol II, Part 2, p. 102, para. 5 of the Commentary on Draft Article 6.

Chile. Bolivia is open and welcomes any cooperation aimed at resolving issues concerning the Silala, especially considering the uncertainties surrounding its waters and their sustainability and governance.

B. Clarifications Needed from Chile Concerning Bolivia's Right to Dismantle the Artificial Drainage Mechanisms and Channels

31. In its Counter-Claims Bolivia requests the Court to make a twofold declaration that Bolivia has sovereignty over the manufactured channelization works located in Bolivian territory and that, as a corollary of its sovereignty, Bolivia can decide whether and how to manage and dismantle that artificial channelization system.⁴⁴ Chile agrees with this Counter-Claim and fully recognizes Bolivia's sovereignty over the drainage mechanism and artificial infrastructure present in the Silala.⁴⁵ However, Bolivia considers that Chile's recognition needs to be clarified because of how Chile refers to and qualifies Bolivia's sovereignty.
32. Chile offers only abstract references to the obligations of riparian states – e.g., equitable and reasonable utilization, prevention of significant harm, and prior notification.⁴⁶ Bolivia agrees with the application of the relevant customary rules. However, Chile's interpretations of those duties might conflict with those of Bolivia's, and thereby constrain Bolivia's sovereign right to decide whether and how to manage and dismantle the artificial channelization system in a manner that is compatible with international law. In particular, such conflicts might arise with respect to Chile's alleged entitlement to its current use of those waters (Subsection 1), Chile's interpretation of Bolivia's

⁴⁴ BCM, para. 165 a).

⁴⁵ CR, para. 1.14.

⁴⁶ CR, para. 1.15.

sovereign right *vis a vis* potential allegations of significant harm (Subsection 2), and Chile's perspective on natural state of the Silala if the artificial drainage mechanisms and channels in Bolivia are dismantled (Subsection 3).

1. BOLIVIA'S RIGHT TO DISMANTLE THE ARTIFICIAL INFRASTRUCTURE AND CHILE'S CURRENT USE OF SILALA WATERS

33. Chile states that it does not contest the right of Bolivia to dismantle the drainage mechanism and artificial infrastructure “insofar as Bolivia’s exercise of sovereignty complies with its obligations regarding the Silala as an international watercourse”⁴⁷. This qualification is even more ambiguous considering that, in its Memorial, Chile asked the Court to adjudge and declare that Chile “*is entitled to its current use of the waters of the Silala River*”⁴⁸.
34. Chile’s qualifications could be read as meaning that Bolivia’s rights to dismantle the artificial infrastructure could be constrained if its actions resulted in a reduction in the current flow regime such that it prevents Chile from enjoying its existing uses. This is what Chile seems to suggest when it claims that it has a “right to the reasonable and equitable use of Silala waters – *all Silala waters, including any that may allegedly have been ‘saved’ by the works constructed in Bolivia*”⁴⁹. However, considering that Chile does not possess such a right under international law, this is a point on which further clarification is required.

⁴⁷ CR, para. 1.14.

⁴⁸ CM, Submission c) (emphasis added).

⁴⁹ CR, para. 2.32 (emphasis added).

2. BOLIVIA'S RIGHT TO DISMANTLE THE ARTIFICIAL INFRASTRUCTURE AND SIGNIFICANT HARM CONSIDERATIONS

35. With regard to the obligation not to cause significant harm, as Chile suggests in its Memorial, “States sharing an international watercourse are under an obligation to take all appropriate measures to prevent the causing of significant harm to other watercourse States”⁵⁰. If Bolivia sought to dismantle the artificial infrastructure that was installed within its territory and return the Silala to its natural, pre-artificial state, it would do so in accordance to its rights and obligations under international law and in a manner that does not create significant transboundary environmental harm. Bolivia therefore agrees with the articulation of the rule, which is correct in its general terms. However, it is its application to the particular circumstances of the Silala that should be further clarified.
36. The obligation not to cause significant harm must be determined proportionally by balancing against the rights of the acting State to pursue its own interests and priorities, such as development and environmental protection and restoration. In the context of development, the Arbitral Tribunal in the *Indus Waters Kishenganga Arbitration* asserted that, “[t]he requirement to avoid adverse effects on Pakistan’s agricultural and hydroelectric uses of the waters of the Kishenganga/Neelum cannot, however, deprive India of its right to operate the [Kishenganga Hydroelectric Plant]”⁵¹.
37. In the *Pulp Mills on the River Uruguay* case, the Court addressed Article 27 of the Statute of the River Uruguay, which permits State Parties to use the

⁵⁰ CM, para. 5.14.

⁵¹ *In the Matter of the Indus Waters Kishenganga Arbitration (Pakistan v. India)*, Partial Award, Permanent Court of Arbitration, 18 February 2013, para. 446.

river's water within their respective jurisdiction for permissible purposes without the obligation of complying with certain procedural requirements found in earlier provisions of the Statute, even "when the use is liable to affect the regime of the river or the quality of its waters"⁵². In that case, the Court asserted that Article 27 "embodies this interconnectedness between equitable and reasonable utilization of a shared resource and the balance between economic development and environmental protection that is the essence of sustainable development"⁵³.

38. In the present case, any potential significant harm as a result of Bolivia's management or removal of the artificial works must necessarily consider Bolivia's purpose and objectives in taking that action. Chile has already recognized Bolivia's right to dismantle the artificial infrastructure in its territory and, with respect to its wetlands in particular, encourages Bolivia to pursue their restoration.⁵⁴ Whether Bolivia decides to remove the drainage mechanisms and artificial channels, to utilize Silala water for domestic or economic activities, or to take other action related to the Silala within its borders lies within Bolivia's sovereign rights.

3. BOLIVIA'S RIGHT TO DISMANTLE THE ARTIFICIAL INFRASTRUCTURE AND THE NATURAL STATE OF THE SILALA WATERS

39. In its Reply, Chile asserts that Bolivia must remove the channels "in a manner not to impair the natural conditions of the Silala water system"⁵⁵. Chile either confuses the current condition of the Silala with its true "natural" state, or has

⁵² Article 27 of the Statute of the River Uruguay, signed at Salto on 26 February 1975.

⁵³ *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, Judgment, I.C.J. Reports 2010, p. 64, para. 177.

⁵⁴ CR, paras. 1.8, 1.14 and 2.73.

⁵⁵ CR, para. 1.8.b).

decided to ignore its artificial aspects. In either case, Chile seems to ask the Court to improperly adjudge the “current” state of the Silala as “natural”.

40. As recognized by Chile to a certain extent⁵⁶, the Silala has been modified from its pre-channelized original condition and flow as a direct result of the installation of a vast network of approximately 6,600 m of artificial channels, pipes and earthen and lined ditches installed within Bolivia and continuing into Chilean territory.⁵⁷ The artificial channelization of the Silala drains groundwater from the region’s aquifers into the artificial network, accelerates groundwater-fed spring flows, and has effectively drained much of the region’s aquifers and wetlands.
41. Prior to the channelization, the Silala region within Bolivia was covered by high altitude wetlands known as *bofedales* that spanned an estimated 141,200 m² (or 14.1 Ha). Today, those wetlands have shrunk to a mere 6,000 m² (or 0.6 Ha).⁵⁸ While the pre-channelization flow regime in the region cannot be definitively characterized, updated hydrologic numerical models of the Silala suggest that surface flows, absent the artificial infrastructure, would decline

⁵⁶ Chile, for instance, refers in its Reply to the artificial waterworks located in Bolivia as “consisting of the excavation of earth channels in the wetlands and straightening and lining of the natural river channel”. CR, para. 2.14.

⁵⁷ BCM, para. 51.

⁵⁸ BCM, para. 73. The data from a recent study provides that: “[...] the total area of study in Silala covers 114,817 m² (11.48 Ha) [...] Of this total, only 7,680 m² (0.76 Ha) correspond to the actual bofedal at present. In conclusion, it can be affirmed that 107,137 m² (10.7 Ha) of bofedal have been lost due to the channelization.” FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 55. **BR, Vol. 3, Annex 23.3**. See DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018. **BR, Vol. 3, Annex 23**.

by 11%-33% below current flow rates.⁵⁹ Today the Silala is no longer in a “natural” state.⁶⁰

42. If Bolivia removes the manufactured infrastructure present in Bolivia’s Silala region, the artificiality of the Silala will begin to reverse and the wetlands, aquifers, springs, and flow regime will slowly begin to return to their natural conditions.⁶¹ However, given the multitude of artificial changes, the Silala waters will never fully revert to its pre-channelized conditions, but rather convert to a new “natural” equilibrium state. This, in turn, will modify the “current” transboundary flow of water in the Silala, which, as noted above, has been enhanced by artificial waterworks. It can be expected that removal of the infrastructure could lead to changes in the Silala as it currently flows into Chile.

43. Dismantling the infrastructure, however, will also lead to effects downstream in terms of water quality. Elimination of the artificial works, in particular the dozens of lateral canals and the concrete desiltation chamber, will allow sand, silt, and other natural elements from the wetlands to infiltrate Silala waters in Bolivia, which will flow across the border into Chile. Moreover, if Chile’s claim is true that the infrastructure was erected for sanitary purposes, specifically to prevent insects from breeding and contaminating the water with

⁵⁹ DHI, Sensitivity Analysis of the Model Boundaries, April 2019, p. 47. **BR, Vol. 5, Annex 25.**

⁶⁰ Danish Hydraulic Institute (DHI), Study of the flows in the Silala Wetlands and Springs System, 2018, Annex I: Questionnaire put by the Plurinational State of Bolivia to DHI, p. 83. **BCM, Vol. 2, Annex 17.**

⁶¹ However, given the multitude of artificial changes that have been imposed on the Silala’s wetlands in Bolivia, their recovery will take “a much longer time scale, probably decades”. Danish Hydraulic Institute (DHI), Study of the flows in the Silala Wetlands and Springs System, 2018, Annex I: Questionnaire put by the Plurinational State of Bolivia to DHI. **BCM, Vol. 2, Annex 17.**

their larva⁶² (which Bolivia asserts was mere pretext), then it may be reasonable to expect insects to start breeding again in Bolivia's Silala region as the wetlands begin to recover toward their pre-channelization, natural extent.

C. Relevance of Bolivia's Counter-Claim a)

44. In response to Bolivia's Counter-Claim a), Chile affirms that it agrees with Bolivia's position and that as a result, there is no dispute between the two Parties on this Counter-Claim. Consequently, Chile claims that the Court either lacks jurisdiction over this Counter-Claim, or that it is moot, or otherwise rejected.⁶³ However, absent any clarification on the exact meaning of Chile's qualifications of Bolivia's rights under Counter-Claim a), Bolivia cannot accept Chile's submission concerning this Counter-Claim.
45. Contrary to Chile's claim that "there is no extant dispute regarding Bolivia's sovereignty over its territory"⁶⁴, disagreements between the Parties continue to exist with respect to Chile's understanding of the actions that Bolivia can take in exercising its sovereign right *vis a vis* maintaining or dismantling the artificial infrastructure located within its territory.⁶⁵ As a result, clarification of Chile's positions is necessary.

⁶² CR, para. 2.19.

⁶³ CR, Submission a).

⁶⁴ CR, para. 1.5.

⁶⁵ According to the jurisprudence of the Court, it "may pronounce judgment only in connection with concrete cases where there exists at the time of the adjudication an actual controversy involving a conflict of legal interests between the parties", which means that the Court has jurisdiction to entertain cases for which the judgment on the merits can "have some practical consequences in the sense that it can affect existing legal rights or obligations of the parties, thus removing uncertainty from their legal relations." *Northern Cameroons (Cameroon v United Kingdom), Preliminary Objections, Judgment, 2 December 1963, I.C.J. Reports 1963*, pp. 33-34. In the present case, the decision of the Court on Bolivia's Counter-Claim "would

CHAPTER 4

POINTS OF DISAGREEMENT BETWEEN THE PARTIES

46. In Chapter 2 of this Rejoinder, Bolivia identified similarities in the conclusions arising from scientific studies as a basis for agreements between the Parties. Then, Chapter 3 of the Rejoinder dealt with the aspects that still require further clarification by Chile. In this final Chapter 4, Bolivia turns to the treatment of the two main issues that still divide the Parties and their experts, namely the volume of artificially flowing waters generated by the artificial infrastructure (Section A) and the legal nature of the artificially enhanced and accelerated surface flow of the Silala (Section B).

A. Disagreement over the Volume of Artificially-Flowing Waters Attributable to the Artificial Infrastructure

47. Before turning to the analysis of the disagreement over the volume of artificially flowing waters generated by the artificial infrastructure and its importance for the comprehension of Silala waters and, in order to assist the Court to understand the *in situ* situation, it is necessary to describe first the degree of magnitude of the hydraulic works installed in Bolivian territory (Subsection 1). This preliminary exercise shows to what extent it is untenable

not be without object because it would affect existing rights and obligations of the Parties [...] and would be capable of being applied effectively by them.” *Application of the Interim Accord of 13 September 1995 (the Former Yugoslav Republic of Macedonia v. Greece)*, Judgment, 5 December 2011, *I.C.J. Reports 2011*, pp. 662-663, paras. 47-54. In addition, a case is not moot when concessions made by one Party do not dispose of the dispute in its entirety. See *Southern Bluefin Tuna Case between Australia and Japan and between New Zealand and Japan*, Award on Jurisdiction and Admissibility, Decision of 4 August 2000, *UNRIIAA*, Vol. XXIII, p. 38, para. 46.

to maintain, as Chile does, that these works have not caused a greater impact on the natural flow of Silala waters (Subsection 2).

1. MAGNITUDE AND CHARACTERISTICS OF THE ARTIFICIAL INFRASTRUCTURE IN THE SILALA

48. The waterworks in the Silala can be identified in Bolivian territory as early as 1906 according to the Water Rights Registry of the Direction-General of Chile (*Dirección General de Aguas*). This Registry referred to the existence of two different dams as source of the concession, one located in Chilean territory and the other in Bolivian territory.⁶⁶
49. In 1997, Bolivia conducted a study in order to identify, among other elements, the characteristics of the canalization system in the Silala. The investigation identifies 94 small collection works; 27,000 m of channels covered with dry masonry; 2,500 m of channels covered with stone masonry with mortar; 17,600 m of 10-inch pipe laying; 4,600 m of 12-inch pipe laying; 1 combined work, loading, unloading, decantation and control in Bolivian territory; 1

⁶⁶ Contrary to Chile's assertions that the intakes and canalization works were installed in Bolivia since 1910 (CR para 2.61 p 46), the 1906 Chilean Concession to THE ANTOFAGASTA-CHILI AND BOLIVIA RAILWAY P.L.C. was registered as follows:

“F.C.A.B. owns a right of 20,500 m³/day equivalent to 237 l/s, from two dams.

Dam 1: Located in the natural course of the Siloli River, in the territory of the Republic of Bolivia, 575 meters east of the international boundary with the Republic of Chile, UTM.

Dam 2: In the Siloli channel, in the territory of Chile, 36 meters west of the Chile-Bolivia international boundary, UTM Coordinates: 7565750 N and 600925 E.

The source of the Siloli River is located in an area called the Cajon spring and part of the eastern springs of the Department of Potosi, Province of San Antonio Lopez, Quetene Vice-Canton, Bolivia, 35.5 kilometers east of the border between Chile and Bolivia.”

See Chile's Direction-General of Water, 2019. **BR, Vol. 5, Annex 28.**

combined work, loading, unloading, decantation and control in current Chilean territory; 1 storage and control work in current Chilean territory.⁶⁷

50. In 2018, more specific studies of the hydraulic works estimated that in the three Silala ravines these works reach almost a hundred drainage mechanisms including a total of 6,429.5 m of built channels.⁶⁸ The slopes of these channels vary from 1.2% to 6.2%⁶⁹, with a more gentle incline in the upper part of the South Ravine which then becomes more steep as the ravine develops (especially in the North Ravine and the Main Ravine). The horizontal alignment of the canals is rectilinear, with an absence of gradual curvature in the changes of direction (atypical in watercourses). The set of collection or intake works were built to operate on the source of water right where it originates trying to reduce the loss of water as much as possible.⁷⁰
51. In the southern ravine, 61 springs have been identified in three categories according to their flow contributions.⁷¹ In this ravine a main canal with a

⁶⁷ R. Gómez-García Palao, *Transboundary Water Resources between the Republics of Bolivia and Chile - Silala*, April 1997, p. 58. **BR, Vol. 2, Annex 22.**

⁶⁸ IHH, *Report: Characterization and Efficiency of the Hydraulic Works Built and Installed in the Silala Sector*, 2018, p. 93. **BR, Vol. 2, Annex 23.1.** See DHI, *Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs*, December 2018. **BR, Vol. 3, Annex 23.** See also Bolivia's Annex of Cartography of the Wetlands of the Silala and Drone video. **BR, Vol. 6, Annex 29 and Annex 30.**

⁶⁹ IHH, *Report: Characterization and Efficiency of the Hydraulic Works Built and Installed in the Silala Sector*, 2018, p. 81. **BR, Vol. 2, Annex 23.1.** See DHI, *Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs*, December 2018. **BR, Vol. 3, Annex 23.**

⁷⁰ IHH, *Report: Characterization and Efficiency of the Hydraulic Works Built and Installed in the Silala Sector*, 2018, p. 92. **BR, Vol. 2, Annex 23.1.** See DHI, *Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs*, December 2018. **BR, Vol. 3, Annex 23.** See also Annex of Cartography of the Wetlands of the Silala and Drone video. **BR, Vol. 6, Annex 29 and Annex 30.**

⁷¹ IHH, *Report: Characterization and Efficiency of the Hydraulic Works Built and Installed in the Silala Sector*, 2018, p. 16. **BR, Vol. 2, Annex 23.1.** See DHI, *Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs*, December 2018. **BR, Vol. 2, Annex 23.**

length of 2,871 m and several secondary canals with a length of 814.5 m have been built; the cross sections of these canals vary between 0.71 to 3.2 m in width and from 0.19 to 0.5 m depth.⁷² (See **Figure 1 and Figure 2**)

⁷² According to the type of canal: i) without coating excavated in natural soil (main: 1,826.0 m, secondary: 764.67 m.); ii) with masonry coating (main: 461.0 m, secondary: 49.8 m); iii) canals in rock (main: 584.0 m, secondary:–). IHH, Report: Characterization and Efficiency of the Hydraulic Works Built and Installed in the Silala Sector, 2018, p. 48. **BR, Vol. 2, Annex 23.1** Cartography of the Wetlands of the Silala. **BR, Vol. 6, Annex 29**. See DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018. **BR, Vol. 2, Annex 23**.

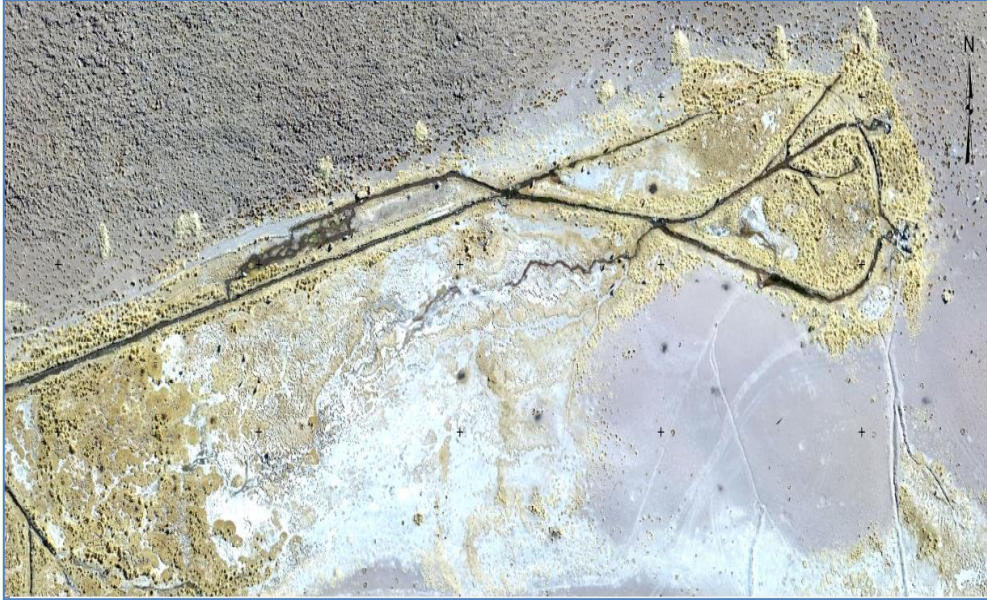


Figure 1: Orthomosaic UAV Image of the South Wetland 01-16.⁷³

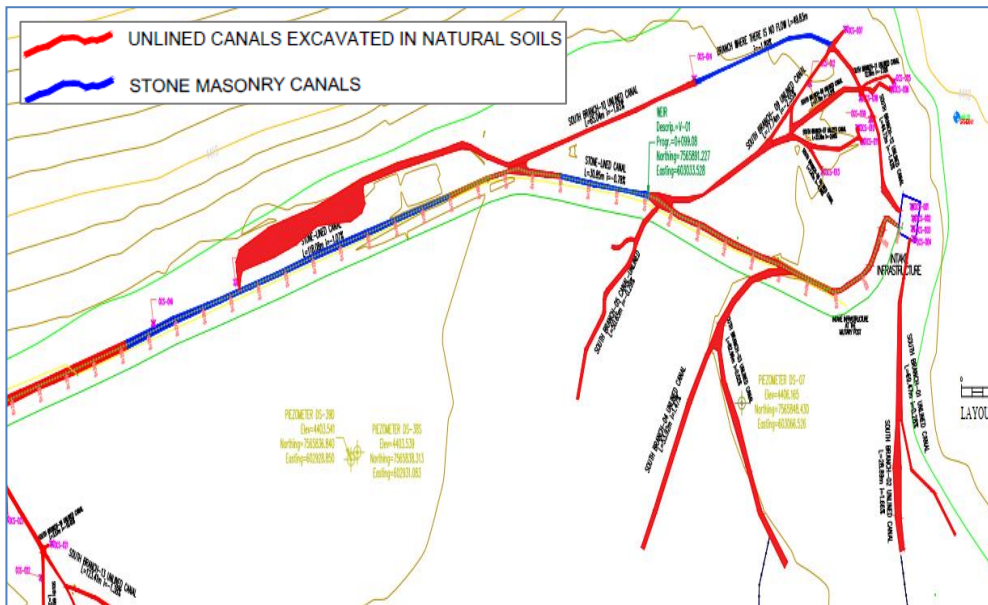


Figure 2: Layout Plan and Profile of the South Canal of the Silala N° 01-16.⁷⁴

⁷³ Plan 1.1 Orthomosaic UAV Image of the South Wetland 01-16. Appendix A, p. 4. **BR, Vol. 6, Annex 29.**

⁷⁴ Layout Plan and Profile of the South Canal of the Silala N° 01-16. Appendix A, p. 5. **BR, Vol. 6, Annex 29.** See also C. Barrón, Study of Georeferencing, Topographic survey and determination of the infiltration capacity in the event of possible surface runoff in the area of the Silala springs, May 2018. **BR, Vol. 2, Annex 23.2.** DHI, Technical Analysis and

52. In the northern ravine, 77 springs have been identified in three categories according to the flow contributions.⁷⁵ The canals constructed in this ravine have cross sections of between 0.40 to 0.48 m in width, and from 0.22 to 0.55 m in depth; the main canal has a length of 688 m, with many secondary canals connecting to the various springs with a collective length of 1,112 m.⁷⁶ These canals are constructed predominantly of stone masonry.⁷⁷ (See **Figure 3 and Figure 4**)

Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

⁷⁵ IHH, Report: Characterization and Efficiency of the Hydraulic Works Built and Installed in the Silala Sector, 2018, p. 18. **BR, Vol. 2, Annex 23.1.** See DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

⁷⁶ Without coating excavated in i) natural soil: main: 170.0 m and secondary: -); ii) with masonry coating: (main: 518.0 m and secondary: 1112.0 m); iii) canals in rock (main: - and secondary: -); Totals: (main: 688.0 m and secondary 1112.0 m). IHH, Report: Characterization and Efficiency of the Hydraulic Works Built and Installed in the Silala Sector, 2018, pp. 58-59. **BR, Vol. 2, Annex 23.1.** See DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

⁷⁷ IHH, Report: Characterization and Efficiency of the Hydraulic Works Built and Installed in the Silala Sector, 2018, p. 58. **Vol. 2, Annex 23.1.** See DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018, **BR, Vol. 2, Annex 23.**

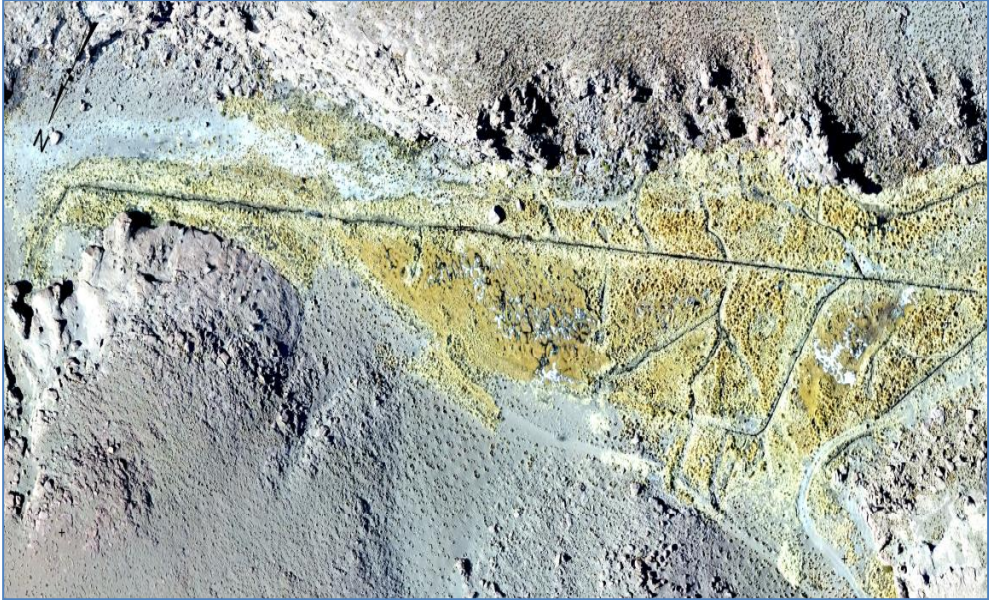


Figure 3: Orthomosaic UAV Image of the North Wetland 14-16.⁷⁸

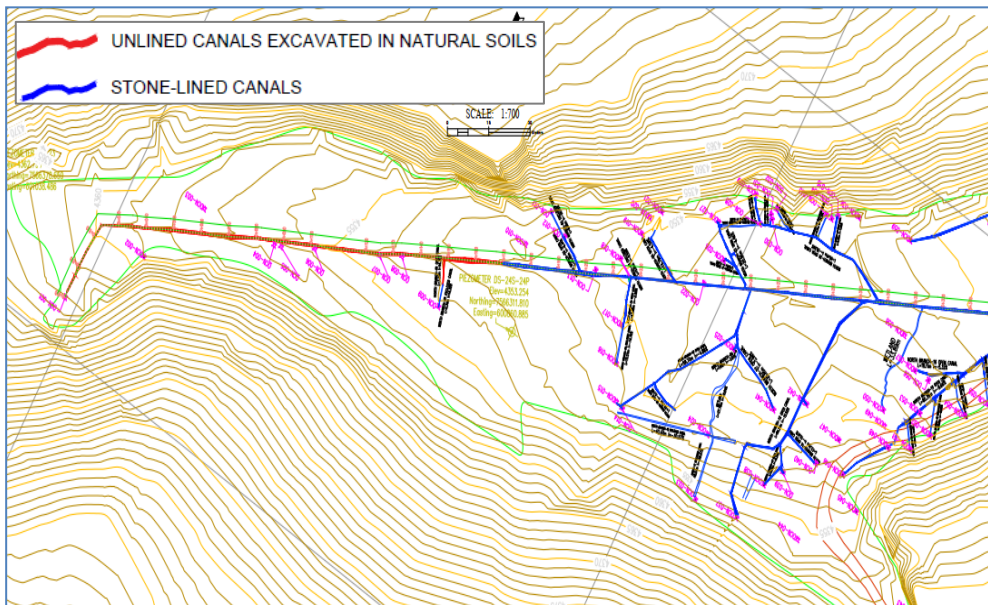


Figure 4: Layout Plan and Profile of the North Canal of the Silala N° 14-16.⁷⁹

⁷⁸ Plan 1.27 Orthomosaic UAV Image of the North Wetland 14-16. Appendix A, p. 30. **BR, Vol. 6, Annex 29.**

⁷⁹ Layout Plan and Profile of the North Canal of the Silala N° 14-16. Appendix A, p. 31. **BR, Vol. 6, Annex 29.** See also C. Barrón, Study of Georeferencing, Topographic Survey and determination of the infiltration capacity in the event of possible surface runoff in the area of

53. In the main ravine, below the confluence of the northern and southern ravines, the canal is of greater capacity than the northern and southern canals, and transports water from both canals to the border. This canal has average dimensions of 0.8 m of width and 0.65 m of depth. It was built with stone masonry lining the walls at its base, and it has a length of 706 m.⁸⁰ (See **Figure 5 and Figure 6**).

the Silala Springs, May 2018. **BR, Vol. 2, Annex 23.2**. DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018. **BR, Vol. 2, Annex 23**.

⁸⁰ IHH, Report: Characterization and Efficiency of the Hydraulic Works Built and Installed in the Silala Sector, 2018, p. 61 **BR, Vol. 2, Annex 23.1**. DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018. **BR, Vol. 2, Annex 23**.



Figure 5: Orthomosaic UAV Image of the Confluence Wetland 11-16.⁸¹

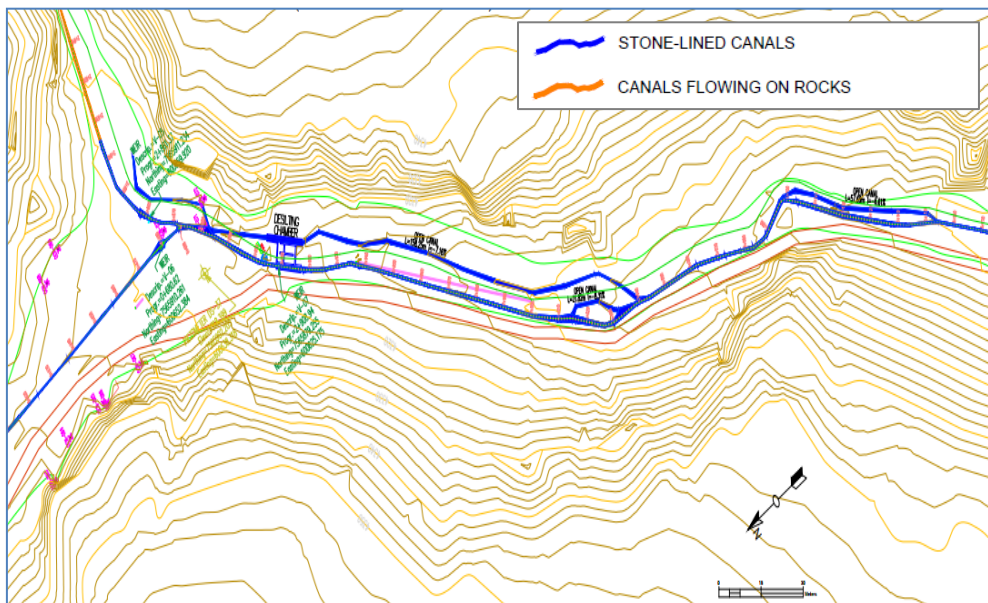


Figure 6: Layout Plan of the Main Canal (Confluence Reach) N° 11-16.⁸²

⁸¹ Plan 1.21 Orthomosaic UAV Image of the Confluence Wetland 11-16. Appendix A, p. 24. **BR, Vol. 6, Annex 29.**

⁸² Plan 1.22 Layout Plan and Profile of the Main Canal (Confluence Reach) of the Silala N° 11-16. Appendix A, p. 25. **BR, Vol. 6, Annex 29.** See also C. Barrón, Study of Georeferencing, Topographic survey and determination of the infiltration capacity in the event of possible surface runoff in the area of the Silala springs, May 2018. **BR, Vol. 2, Annex 23.2.** DHI,

54. The main canal crosses the border from Bolivian territory into Chilean territory and continues for a few meters until reaching the desiltation chamber. From this desiltation chamber, Chile diverts the water through pipes and canals to the Codelco copper mines, as well as to water distribution systems in Antofagasta and Calama and other Chilean cities.



Figure 7: Main channel crossing the Bolivian-Chilean border.
(Source: DIREMAR, 2019)

55. For illustrative purposes, the following table indicates the extension of each channel type:

TYPE OF CHANNEL	WITHOUT COATING EXCAVATED IN NATURAL SOIL	WITH MASONRY COATING	CANALS IN ROCK	TOTALS
SOUTH BOFEDAL				
Main	1826.0	461.0	584.0	2871.0
Secondary	764.67	49.8	–	814.5
NORTH BOFEDAL				
Main	170.0	518.0	–	688.0
Secondary	–	1112.0	–	1112.0
CONFLUENCE REACH				
Main	0.0	706.0	–	706.0
Secondary	–	238.0	–	238.0

Table 1: Channel Types in the Silala. Source: DIREMAR based on IHH, 2018.⁸³

2. CONTRIBUTION OF THE ARTIFICIAL INFRASTRUCTURE TO THE SILALA WATERS

56. Having described the magnitude of the works in the previous subsection, the present section of this Rejoinder focuses on the ill-founded and scientifically flawed contentions made in Chile’s Reply with respect to the question of the volumes of water generated by the extensive artificial waterworks installed in the Silala. To this end, this subsection addresses Chile’s criticism of Bolivia’s

⁸³ IHH, Report: Characterization and Efficiency of the Hydraulic Works Built and Installed in the Silala Sector, 2018, pp. 48, 59 and 62. **BR, Vol. 2, Annex 23.1.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies concerning the Silala Springs. **BR, Vol. 2, Annex 23.**

model (2.1) and, then, turns to the follow-up studies that further confirm the impact of artificially enhanced and accelerated surface flow of Silala (2.2).

2.1. Chile's Criticism of Bolivia's Model is Scientifically Flawed and Based on Theoretical Oversimplifications

57. As part of its Counter-Memorial, Bolivia submitted scientific reports based on extensive integrated numerical modeling that described expected conditions on the Silala without the channels and drainage mechanisms. The model evidenced that, if the channels and drainage mechanisms were removed, the Silala surface flows would decrease by 30%-40%, evapotranspiration from the restored wetlands would increase by 20%-30%, and sub-surface groundwater flow through the 450 m wide cross-section of the Silala catchment area at the Bolivian-Chilean border would increase by 7% -11%.⁸⁴

58. In sharp contrast to Bolivia's analysis, and despite not having conducted any study in the field in Bolivian territory, Chile has sought to discount Bolivia's studies arguing that the series of artificial works described have had, at most, an insignificant impact on cross-border water flow and volume in the Silala. In its Reply, Chile alleges that "Bolivia's estimation of 30%-40% 'artificially-enhanced flow' [...] is [...] grossly exaggerated"⁸⁵. Chile does not offer its own estimates as to the volumetric effect of the artificial infrastructure on the Silala's water flow (it nonetheless acknowledges that such an effect has occurred).

⁸⁴ BCM, para. 70.

⁸⁵ CR, para. 1.9.

59. Chile maintains that “the model [developed by the experts of Bolivia] is based on an incorrect understanding of geology and hydrogeology”⁸⁶. In particular, Chile’s experts argue that the model “does not represent the geology correctly either stratigraphically or structurally and invokes a fault system that is both unmapped and geometrically highly unlikely”⁸⁷.
60. Bolivia’s experts have assessed all of the observations made by Chile’s experts and consider that Chile’s criticisms are highly simplified and ignore the peculiarities of the flow of the Silala waters.⁸⁸ Particularly, DHI observed that “the validity of Chile’s simplified impact calculation is questionable and therefore do not support the claim that DHI’s impact are exaggerated. The analysis [made by Chile] is based on the one-dimensional Darcy equation, which is only valid under idealized conditions not satisfied at Silala”⁸⁹. In DHI’s view “The groundwater aquifer is *not* homogenous [...] The groundwater flow is *not* one dimensional but rather highly three-dimensional. In particular, the one-dimensional Darcy approach does not represent correctly the observed changes in groundwater gradients and therefore the flows towards the spring discharge zone and lacks reference to field data”⁹⁰.
61. DHI also asserts that “Chile emphasizes the importance of the highly complex [...] geology, yet they ignore this complex geology in their simplified

⁸⁶ CR, para. 3.18.

⁸⁷ CR, Expert Report: Peach D. W. and Weather, H. S., Concerning the Geology, Hydrogeology and Hydrochemistry of the Silala River Basin, p. 35. CR, Vol. 1, p. 201.

⁸⁸ DHI, Analysis and Assessment of Chile’s Reply to Bolivia’s Counter-Claims on the Silala Case, March 2019. **BR, Vol. 5, Annex 24.**

⁸⁹ DHI, Analysis and Assessment of Chile’s Reply to Bolivia’s Counter-Claims on the Silala Case, March 2019, p. 7. **BR, Vol. 5, Annex 24.**

⁹⁰ DHI, Analysis and Assessment of Chile’s Reply to Bolivia’s Counter-claims on the Silala Case, March 2019, p. 7. **BR, Vol. 5, Annex 24.**

analysis. This is a clear inconsistency, which brings into question the validity of their assessments of the canalization impact.”⁹¹ Concerning Chile’s observations on the inexistence of a fault zone with high hydraulic conductivities, DHI considers that “the field data do support DHI’s hydrogeological model and it is consistent with Chile’s borehole information.”⁹² Hence, the “technical approach employed [...] allowed for the development of a numerical model that was calibrated to field characterization data including hydraulic parameters and head distributions at various depths.”⁹³

62. The evidence for the Silala fault and fractures is supported by the studies completed by SERGEOMIN (2003)⁹⁴ and (2017)⁹⁵ as well as recent studies conducted by Bolivian experts and the Tomás Frías Autonomous University.⁹⁶

⁹¹ DHI, Analysis and Assessment of Chile’s Reply to Bolivia’s Counter-claims on the Silala Case, March 2019, p. 8. **BR, Vol. 5, Annex 24.**

⁹² DHI, Analysis and Assessment of Chile’s Reply to Bolivia’s Counter-claims on the Silala Case, March 2019, p. 8. **BR, Vol. 5, Annex 24.**

⁹³ DHI, Analysis and Assessment of Chile’s Reply to Bolivia’s Counter-claims on the Silala Case, March 2019, p. 8. **BR, Vol. 5, Annex 24.**

⁹⁴ SERGEOMIN (National Service of Geology and Mining), Study of the Geology, Hydrogeology and Environment of the Area of the Silala Springs, June 2000-2001, Final Edition 2003, p. 18. **BR, Vol. 3, Annex 23.5, Appendix A.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

⁹⁵ SERGEOMIN, Structural Geological Mapping of the Area Surrounding the Silala Springs, September 2017, pp. 59-61 and pp. 84-86. **BR, Vol. 4, Annex 23.5, Appendix B.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

⁹⁶ F. Urquidi, Technical Analysis of Geological, Hydrological, Hydrogeological and Hydrochemical Surveys completed for the Silala Water System, June 2018. **BR, Vol. 3, Annex 23.5.** Tomás Frías Autonomous University (TFAU), Hydrogeological Characterization of the Silala Springs, 2018, pp. 6-8 and pp. 17-18. **BR, Vol. 4, Annex 23.5, Appendix c.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning Silala Springs, December 2018. **BR, Vol. 3, Annex 23.**

2.2 Follow-up Studies Further Confirm the Impact of Artificially Enhanced and Accelerated Surface Flow of the Silala

63. Given the complex nature and numerous uncertainties of the Silala, as well as the limited availability of data, especially in the Far Field area of the Silala ravine, Bolivia and its experts have continued to refine their modeling based on actual field measurements in the Near Field, as well as by conducting a sensitivity analysis of the model boundaries.⁹⁷
64. The results of the updated model, whose geographic extent is necessarily constrained to the Near Field area⁹⁸, indicates that, if the channels and drainage mechanisms were removed, cross-border surface flows in the Silala would decrease by 11% to 33% of current conditions.⁹⁹ The study further reveals that evapotranspiration from wetlands without canals will increase by 28% to 34% of the reference values, i.e. between 2.8 and 3.4 l/s, while groundwater flows across the 450 m wide Silala cross-section at the border will increase between 4% and 10% as compared to current conditions. Similar results are determined by the sensitivity analysis in relation to a scenario with restored wetlands.¹⁰⁰
65. Bolivia's expert's model is consistent with field observations that were conducted as early as 1922, and documented that in that year only 131 l/s

⁹⁷ A sensitivity analysis is the study of how the uncertainty in the output of a mathematical model or system (numerical or otherwise) can be divided and allocated to different sources of uncertainty in its inputs. **BR, Vol. 5, Annex 25.**

⁹⁸ Contrary to Chile's assertions, assessing the Silala's flow regime with and without the artificial infrastructure is infeasible and "would inevitably be based on a lot of assumptions about the presently uncharacterized areas of the aquifer." DHI, Sensitivity Analysis of the Model Boundaries, April 2019, p. 19. **BR, Vol. 5, Annex 25.**

⁹⁹ DHI, Sensitivity Analysis of the Model Boundaries, April 2019, p. 37. **BR, Vol. 5, Annex 25.**

¹⁰⁰ DHI, Sensitivity Analysis of the Model Boundaries, April 2019, pp. 31-32, and p. 37. **BR, Vol. 5, Annex 25.**

flowed across the border.¹⁰¹ That volume is 18%-38% lower than present observations (160-210 l/s), and correspond to the findings of Bolivia's experts. Bolivia's argument regarding the volume of artificially flowing waters attributable to the artificial infrastructure is two-fold.

66. On the one hand, the water that is "generated" by the engineered works in Bolivia due to a reduction of 28% to 34% in evapotranspiration from the wetlands (accounting for between 2.8 and 3.4 l/s of current surface flows), comprises water that would never have reached Chile under natural, non-channelized conditions. Chile has already recognized this.¹⁰² Furthermore, a recent study completed in Bolivia has quantified a restored bofedal evapotranspiration of approximately 5.9 l/s.¹⁰³
67. On the other hand, the volume of artificially-flowing Silala waters attributable to the engineered infrastructure also includes water that originates from wetlands in Bolivia. The numerous engineered lateral canals effectively drain the aquifers and wetlands and drain the groundwater into the Silala channel, which then transmits the water, along with naturally occurring surface flows, into Chile. According to Bolivia's experts, and as had already been observed by Fox's field study in 1922, the artificial component of the surface flows crossing the border into Chile amounts to between 11%-33% of current surface flows. While under non-channelized conditions this water would have

¹⁰¹ Robert H. Fox, "The Waterworks Department of the Antofagasta (Chili) & Bolivia Railway Company", South African Journal of Science, 1922, p. 123. **CM, Vol. 3, Annex 75.**

¹⁰² CR, para. 3.47.

¹⁰³ FUNDECO, Study on the Water Requirements of the Silala Wetlands, April 2019, p.44. **BR, Vol. 5, Annex 26.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

eventually flowed into Chile as groundwater, that flow would have occurred on a different time scale.

68. The artificial infrastructure in Bolivia has transferred a percentage of the groundwater to the surface waters, accelerating its flow to Chile at a velocity that is exponentially faster than the groundwater flow that normally moves through aquifers. The surface flows of the Silala from Bolivia to Chile have been enhanced in terms of volume and flow. Bolivia has conducted studies on the velocity of the water that flows in the channels and has concluded that the water reaches a velocity of 0.4 m/s, with extremes that vary between 0.2 m/s and 1.0 m/s, approximately.¹⁰⁴
69. The artificial infrastructure has also drained the waters that were naturally retained by the wetlands for their functioning. It should be noted that “wetlands need an adequate amount and quality of water [...] to sustain nature and to provide water-related ecosystem services and benefits to humans.”¹⁰⁵ In this regard, new studies carried out by Bolivia in the Silala bofedals, in its territory, to quantify the water requirements of these resources have revealed that the volume of water that is currently retained in their peat is of approximately 48.4 thousands of m³, which would increase 7 times - up to 353.8 thousands of m³ - once the bofedals are restored.¹⁰⁶

¹⁰⁴ IHH, Characterization and Efficiency of the Hydraulic Works built and installed in the Silala Sector, 2018, p. 93. **BR, Vol. 2, Annex 23.1**. DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning Silala Springs, December 2018. **BR, Vol. 2, Annex 23**.

¹⁰⁵ S. Barchiesi, P.E. Davies, K.A.A Kulindwa, G. Lei, and L. Martinez Ríos del Río, Implementing environmental flows with benefits for society and different wetland ecosystems in river systems, Ramsar Policy Brief No. 4, 2018, Gland, Switzerland, Ramsar Convention Secretariat. Available at <https://bit.ly/2V7NfUv>.

¹⁰⁶ FUNDECO, *Study on the Water Requirements of the Silala Wetlands*, April 2019, p. 54. **BR, Vol. 5, Annex 26**. DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning Silala Springs, December 2018. **BR, Vol. 2, Annex 23**.

B. Disagreement over the Legal Nature of the Artificially Enhanced and Accelerated Surface Flow of the Silala

70. Bolivia submitted in its Counter-Claims b) and c) that it “has sovereignty over the artificial flow of Silala waters engineered, enhanced, or produced in its territory, and Chile has no right to that artificial flow”, and “that any delivery of artificially-flowing waters of the Silala to Chile” is “subject to the conclusion of an agreement with Bolivia”¹⁰⁷. Bolivia further argued that customary international law on the use of transboundary watercourses applies “only to the rate and volume of Silala water that flows naturally across the Bolivian-Chilean border”¹⁰⁸. Moreover, it maintained that, in the absence of an agreement between “Bolivia and Chile on the management or distribution of the Silala and its waters, Bolivia has full rights and authority over the artificially created flows and volumes of Silala water coursing across that frontier”¹⁰⁹. Bolivia’s position is supported by its sovereignty and rights over the artificial infrastructure within its territory, which Chile has recognized (Subsection 1), and the benefits accruing to Chile resulting from the artificial flow of Silala water into Chile (Subsection 2).

1. BOLIVIA’S SOVEREIGNTY OVER THE ARTIFICIAL INFRASTRUCTURE IN ITS TERRITORY AFFORDS BOLIVIA SOVEREIGNTY OVER THE ARTIFICIAL FLOWS GENERATED BY THAT INFRASTRUCTURE

71. Bolivia, in exercising its sovereignty over the waterworks located within its territory, has no legal or any other obligation to maintain the artificial channels and drainage mechanisms. Similarly, Bolivia is not required to

¹⁰⁷ BCM, paras. 165 b) and c).

¹⁰⁸ BCM, para. 110.

¹⁰⁹ BCM, para 110.

maintain the artificial flows crossing the Bolivian-Chilean border. This is not contested by Chile, which has recognized Bolivia's sovereignty over the waterworks located within its territory and its "right to decide whether and how to maintain" these works.¹¹⁰

72. Despite this recognition, Chile relies on Article 25 of the 1997 Watercourses Convention to contest the implications of the artificial flow generated by the drainage mechanisms and channelization works in the Silala waters, thereby questioning Bolivia's sovereign right over this component of the flow¹¹¹. Chile does not engage in any effort to show how this provision applies to non-state parties to the Convention. In addition, the *travaux préparatoires* demonstrates that this article was never intended to address the augmentation of the volume of the watercourse flow through artificial works, but only to the augmentation of the efficiency and quality. According to Article 25(3) of both the ILC Draft Articles and 1997 Watercourses Convention, the "regulation" refers only to "the use of hydraulic works or any other continuing measure to alter, vary or otherwise control the flow of the waters". Finally, the case law referred to by Chile in its Reply does not concern the augmentation of the volume of the flow of water, but rather to the improvement of navigation, flooding management, making existing flows more efficient, and providing water for various uses.¹¹²

73. Moreover, Chile mistakenly refers to a decision of the Supreme Court of Colorado of 1984 to conclude that "salvaged water", meaning "tributary water made available for beneficial use through elimination of waste", cannot

¹¹⁰ CR, para 1.14

¹¹¹ CR, para. 2.7.

¹¹² CR, para. 2.7.

provide the basis for a water right that is independent of the system of water rights on the stream.¹¹³ While apparently pertaining solely to the water “created” by the artificial infrastructure (water that would not flow to Chile under non-channelized conditions), this decision is not dispositive to the present case.

74. A more recent, contrary case can be found in another US State (California). In *City of Santa Maria v. Adam*¹¹⁴, the Court of Appeal of California defined “salvaged water” as “water that is saved from waste as when winter floodwaters are dammed and held in a reservoir” and concluded that “a priority right to salvages water belongs to the one who made it available”. In this case, one of the parties collected and stored storm water (that would otherwise have flowed to the sea unused) behind a reservoir that augmented the underlying aquifer. The Court determined that the augmented volume of water in the aquifer constituted “salvaged” water and was owned by the party that created it. It also stated that even if the augmented water was released and allowed to flow in the stream, it was “foreign in time” and therefore constituted “rescued water; the rescuer has the prior right to it”.
75. It is also noteworthy that the *City of Santa Maria v. Adam* case relied on an earlier case, *i.e. Pomona etc. Co. v. San Antonio etc. Co.*¹¹⁵ In the latter case, the California Supreme Court ruled that 19% of the natural flow that was salvaged through various structures installed in the upper segment of the river belonged to the upstream user so long as the downstream riparian received

¹¹³ CR, paras. 2.8-2.10.

¹¹⁴ *City of Santa Maria et.al. v. Adam et. al.*, Court of Appeal, Sixth District, California, November 21, 2012, 211.

¹¹⁵ *Pomona etc. Co. V. San Antonio etc. Co.*, Supreme Court of California, 17 January 1908, 152 Cal. 618 (1908)

the volume of water that they were normally entitled to. The Court also ruled that the waters that were “rescued” by the upstream user were essentially “new waters”, and the right to use and distribute that new water belonged to the upstream party that produced them.

76. It is also worth mentioning that the EU Water Framework Directive (2000) considers the “artificial” character and “highly modified” of waters generated by human intervention in the following terms:

“8. Artificial water body means a body of surface water created by human activity.

9. Heavily modified water body means a body of surface water which as a result of physical alterations by human activity is substantially changed in character [...]”¹¹⁶

77. Although the terms “artificial water body” and “heavily modified water body” refer to bodies of water at a surface level that have undergone alterations and require States to protect, improve and regenerate them¹¹⁷, the common and central element is that the alterations have been caused by human activity, as in the Silala. The presence of artificial works and drainage mechanisms has caused noticeable and quantitative impacts, such as the increase in the Silala flow and the degradation of wetlands in Bolivian territory.

78. With respect to the issue of territorial sovereignty, Chile’s argument based on the condition of shared natural resource is both misplaced and contrary to

¹¹⁶ European Parliament and the Council of the European Union, *Directive 2000/60/EC establishing a framework for Community action in the field of water policy*, 23 October 2000, p. L. 327/6.

¹¹⁷ European Parliament and the Council of the European Union, *Directive 2000/60/EC establishing a framework for Community action in the field of water policy*, 23 October 2000, p. L. 327/9.

Chile's own position.¹¹⁸ First, Bolivia's Counter-Claims b) and c) only apply to the artificial infrastructure and artificially enhanced flow of water in the Silala. Second, Chile admits that Bolivia has sovereignty over the artificial channels and drainage mechanisms. Third, as Chile stated before the United Nations General Assembly in 2013 in relation to the law applicable to transboundary aquifers, the general principles of customary international law include "the sovereign right of each State to promote the management, supervision and sustainable use of an aquifer in its own territory"¹¹⁹. This language confirms that there is nothing contradictory, as a matter of principle, with the claim of sovereignty over transboundary natural resources.

79. In its Reply, Chile also refers to the terms "sovereignty" and "exclusive sovereignty", suggesting that they have different meanings and that Chile agrees with the idea that Bolivia has sovereignty, but not exclusive sovereignty.¹²⁰ Again, Chile's argument is misguided. Bolivia does not disagree with Chile on the principle that an international watercourse is a shared natural resource under contemporary international law, and subject, therefore, to the limited sovereignty of all of the riparian States.¹²¹ The issue in the present case, however, is that Chile seems to question Bolivia's sovereignty over the artificial flow.¹²²

¹¹⁸ CR, para. 2.26 ff.

¹¹⁹ United Nations General Assembly, Sixty-eighth Session, 2013, UN Doc. A/C.6/68/SR.16, 2013, para. 47.

¹²⁰ CR, paras. 2.27-2.28.

¹²¹ CR, para. 2.29 ff.

¹²² Chile's assertion that Bolivia does not have exclusive sovereignty over the artificial flow – because, "[e]ven if, *quod non*, any portion of the flow of the Silala is 'enhanced' as Bolivia contends, that is still part of the Silala system of waters, a system that Bolivia shares with Chile", CR, para. 2.29.

80. In its Reply, Chile refers to the *Lac Lanoux Arbitration* case to suggest that by claiming sovereignty over the artificial flows in the Silala, Bolivia is asserting a right of veto over Chile to receive Silala waters.¹²³ That decision, however, is inapposite to the present case since it did not concern a situation where a downstream State is taking advantage of artificial mechanisms within an upstream State, which are augmenting the flow of water into the downstream State's territory.

2. AS A RESULT OF THE ARTIFICIAL INFRASTRUCTURE IN BOLIVIA OVER WHICH BOLIVIA MAINTAINS SOVEREIGNTY, CHILE IS ACCRUING BENEFITS THAT BOLIVIA HAS NO OBLIGATION TO MAINTAIN

81. As a consequence of the artificial flows in the Silala, Chile is accruing considerable benefits, at no cost (either environmental or financial), that it would not receive under natural, non-channelized conditions. Chile has already acknowledged that up to 2% of the Silala's current flow relates to water that would have evaporated from the wetlands had they not been drained by the artificial works.

82. The engineered channels and drainage mechanisms in Bolivia have transferred groundwater from springs within Bolivia into surface water and accelerated the flow of that former groundwater into Chile via surface flows, thereby delivering Silala groundwater to Chile years (and possibly longer) before they would have presumably reached the border under natural conditions.¹²⁴ As a result, Chile is able to use that water today at no additional

¹²³ CR, paras. 2.24-2.25.

¹²⁴ Describing the age of groundwater in the subsurface as 1,000 years in the Northern and 11,000 in the Southern wetlands, as explained by DHI: "The existing channels provide a network that drain the groundwater and conveys this water rapidly away from the Silala springs. By removing the channels, the groundwater is drained less efficiently, the resistance to flow emerging on the surface is increased and the groundwater levels will increase"). DHI,

cost, and with no consideration for the future consequences that such accelerated and enhanced flows might provoke to the springs and the wetlands in Bolivia.

83. Chile is receiving additional surface water via the artificial flows that under natural conditions presumably would have flowed through the subsurface. As a result, Chile is benefitting from not having to invest and engage in securing water from other, more costly sources of freshwater, such as diversions from distant sources or having to employ drilling and pumping technology and developing a well field on its side of the border to access the transboundary groundwaters. Moreover, Chile is benefitting from not having to ensure that such actions, especially pumping from aquifers that traverse the Bolivian-Chilean border, abide by its obligations under customary international law *vis a vis* Bolivia.¹²⁵

84. The benefits described are specifically and directly derived from the manufactured channels and drainage mechanisms installed inside Bolivian territory. They are not the product of the natural conditions of the Silala waters. As a result, absent any agreement between Bolivia and Chile on the benefit accruing from these artificial infrastructures, Bolivia is entirely entitled to maintain, dismantle, or otherwise manage those works in conformity with its own interests and customary international legal norms governing transboundary watercourses.

Sensitivity Analysis of the Model Boundaries, April 2019, pp. 15 and 27. **BR, Vol. 5, Annex 25.**

¹²⁵ See CR, para. 1.3. This would require Chile to warrant that its extractions and uses do not violate its equitable and reasonable use and no significant harm obligations, and that its actions comport with prior notification, environmental impact assessments (including to determine whether or not there is a risk of depleting the aquifers), exchange of data and information, and related responsibilities that Chile has previously recognized as binding under customary international law.

85. It is important to note, and Bolivia takes note for any future action, that Chile excludes its own responsibility over the canals, and recognizes that the FCAB Company built and installed waterworks in Bolivian territory.¹²⁶ Notwithstanding the above, Chile can neither deny nor ignore that the advantages it has been receiving as a result of the artificial waterworks in Bolivia are consequence of an intensive exploitation of and impact on Bolivia's wetlands (2.1) in a context that should instead call for advanced bilateral cooperation and agreed formulas of mutual benefit (2.2).

2.1. Impact of the Artificial Channels and Drainage Mechanisms on Bolivia's Wetlands

86. For a century, the use of the channels has solely benefited Chile through an accelerated artificial flow resulting from the canalization works. The wetlands in Bolivia's territory have significantly reduced their extension, due to the drying up of the bofedals, as has been verified by the Ramsar Inspection Mission in Bolivia.¹²⁷

87. Chile notes that the conclusions of the Ramsar report on the degradation of wetlands in the Silala are not justified and contradict DHI's observations and other expert reports.¹²⁸ Chile reached such a conclusion on the basis of a comparison between the wetlands located in Bolivian territory and the wetland of the Negra Ravine located in Chile. In support to its claim, Chile

¹²⁶ See CR, paras. 2.70-2.71. As a result of these waterworks, the flows of the Silala waters were increased and utilized for human consumption and industrial purposes in Chilean territory. In the context of the concession granted to the Bolivian company DUCTEC S.R.L., Bolivia sought to bill water operators for the exploitation of these waters, and Chile objected. See: Note S/N of The Antofagasta (Chili) and Bolivia Railway P.L.C. addressed to the Company DUCTEC S.R.L., Antofagasta, 23 August 2000. **BR, Vol. 5, Annex 27.**

¹²⁷ See Ramsar Convention Secretariat, Report Ramsar Advisory Mission N° 84, Ramsar Site Los Lipez, Bolivia, 2018. **BCM, Vol. 5, Annex 18.**

¹²⁸ CR, p. 68.

submitted a Table (see below), which provides a comparison of the area of the Cajones and Orientales bofedals (from July to November 2018).

	Area covered by active vegetation (ha)				
	July	August	September	October	November
Quebrada Negra wetland	2.13	2.31	2.58	4.12	3.43
Cajones wetland	0.81	1.12	1.31	2.20	2.41
Orientales Wetland	2.23	2.70	2.86	6.09	7.50

Table 2: Table 5-1. Area covered by active vegetation (NDVI > 0.2) in the Quebrada Negra, Cajones and Orientales wetlands, from July to November 2018 (Table 5-1).¹²⁹

88. This Table appears to indicate that the Orientales wetlands grew geographically 4.64 Ha in one month, from 2.86 Ha in September to 6.09 Ha in October, and to 7.50 Ha in November, suggesting an overall expansion of 250% during this time period. This conclusion contradicts the scientific data and the characteristic of the Silala area. As result of the high altitude and extreme temperatures of the area, the growth of the bofedals is very slow. The growth from 2.86 Ha to 7.50 Ha in a period of two months is an overestimation that reveals flawed calculation that cannot be reasonably accepted.

89. Chile’s experts also concluded that the channelization activities in the Bolivian wetlands, which are focused entirely on the flat topography of the valley floors, have not significantly affected the area of active wetlands in valley floors.¹³⁰ Chile went even further and claimed that the Ramsar’s conclusions “appear wholly unfounded and counterfactual”¹³¹, without

¹²⁹ Muñoz, J.F. and Suárez, F. Negra Ravine Wetland Study, 2019, p. 52. CR, Vol. 3, Annex XIII.

¹³⁰ CR, Wheater, H. S. and Peach D. W., Impacts of the Canalization of the Silala River in Bolivia on the Hydrology of the Silala River Basin, p. 40. CR, Vol. 1, p.136.

¹³¹ CR, para. 3.43.

conducting any field study of its own. This is another failed attempt to minimize the impact of the drainage mechanisms and canalization system on the loss of biodiversity in the Silala, in addition to that demonstrated on the flow rate and flow volume, and on the geographic extent of the bofedales.

90. The scientific evidence presented with this Rejoinder supports the conclusion that “the reduction of the bofedal area as a consequence was of approximately of 94%”¹³². The degradation of the wetlands and the reduction of their extension has been confirmed by FUNDECO in 2018, whose methodology is based on field visits and observations.¹³³ This recent study concludes that the Silala bofedals are in a fragmented¹³⁴, degraded and highly vulnerable state¹³⁵, as a result of the hydraulic works, adding that:

“[...] the total area of study of Silala covers 114,817 m² (11.48 hectares). Most of the wetland corresponds to the South Bofedal (87,892 m²), while the North Bofedals and confluence area are smaller (20,290 m² and 6,635 m², respectively). Of this total, only 7,680 m² (0.76 hectares) correspond to actual bofedal at present. In conclusion, it

¹³² FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, May 2018, p. 7. **BR, Vol. 3, Annex 23.3**. For the study palynological study, see: FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, Palynology, 2018. **BR, Vol. 3, Annex 23.4**. DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018. **BR, Vol. 2, Annex 23**.

¹³³ The calculations of the surface of the wetland cited by the Ramsar Report, of 0.6 Ha coincide with the results of the FUNDECO study that calculates the current area of the bofedals in 0.7 Ha based on satellite images and field botanical studies. FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 6. **BR, Vol. 3, Annex 23.3**. DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018. **BR, Vol. 2, Annex 23**.

¹³⁴ “Of the 10 fragments evaluated, five are strongly degraded, one is in a degraded state, three sites are in a regular state and only one fragment arrived in good conditions [...], but still its quality is very low”. FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 87. **BR, Vol. 3, Annex 23.3**. DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018.

¹³⁵ FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 102. **BR, Vol. 3, Annex 23.3**. DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018.

can be affirmed that 107,137 m² (10.7 hectares) of bofedal have been lost due to the canalization”¹³⁶.

91. The FUNDECO study highlights the impacts of the canalization on the Silala bofedals and distinguishes the areas of study in three bofedals: North Bofedal, South Bofedal and Confluence Bofedal. The South Bofedal is the most degraded and fragmented.¹³⁷

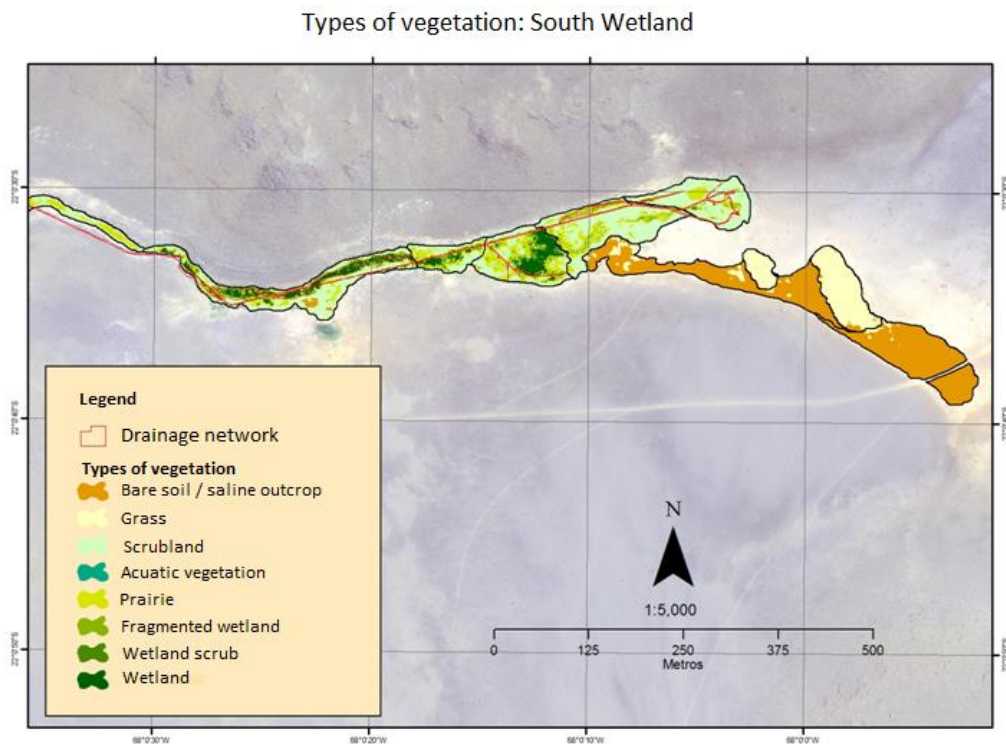


Figure 8: Types of Vegetation in the South Wetland.¹³⁸

¹³⁶ FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 55. **BR, Vol. 3, Annex 23.3.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018.

¹³⁷ FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 12. **BR, Vol. 3, Annex 23.3.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018.

¹³⁸ Image 2, Appendix C, p. 51. **BR, Vol. 6, Annex 29.** See also FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 13. **BR, Vol. 3, Annex 23.3.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

92. The North Bofedal has also been drained. Areas with predominance of bofedal-characteristic species have been identified, but also areas with alterations of open canals.¹³⁹

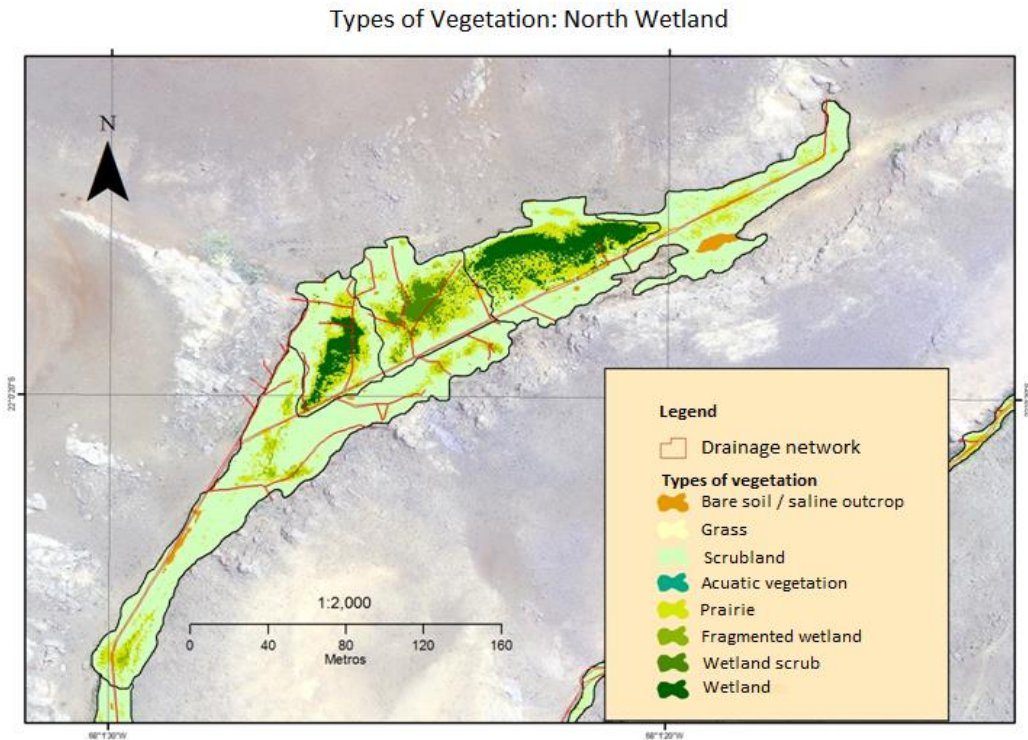


Figure 9: Types of Vegetation in the North Wetland.¹⁴⁰

¹³⁹ FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 6. **BR, Vol. 3, Annex 23.3.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

¹⁴⁰ Image 1, Appendix C, p. 50. **BR, Vol. 6, Annex 29.** FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 14. **BR, Vol. 3, Annex 23.3.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

93. The Confluence Bofedal is significantly degraded. A mixture of grasses with a reduced number of species common to bofedals have been found.¹⁴¹

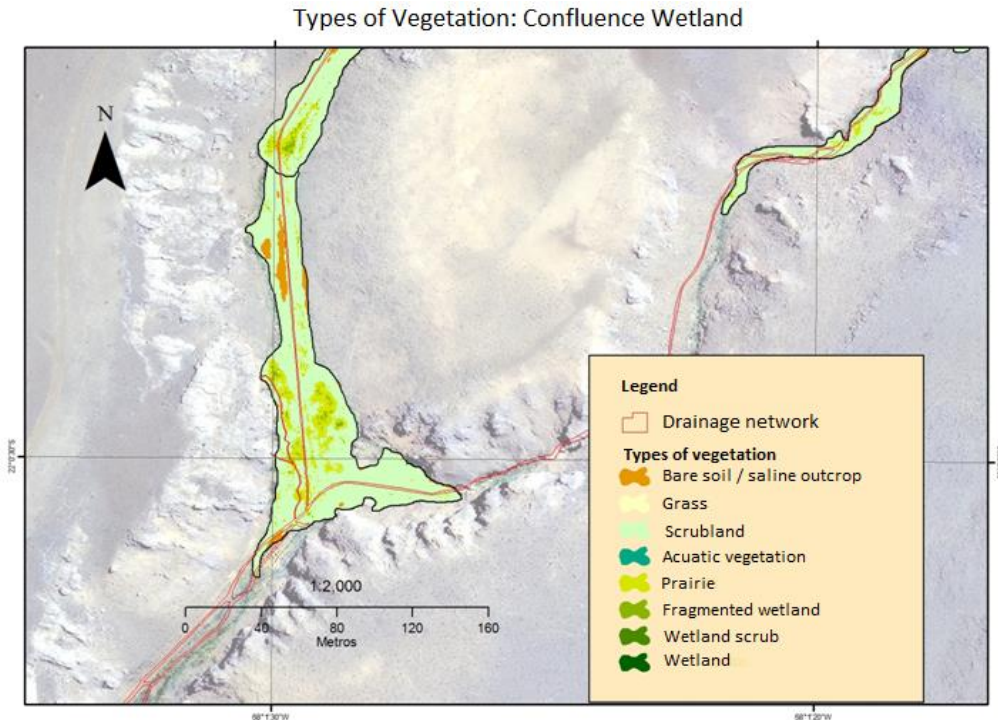


Figure 10: Types of Vegetation in the Confluence Bofedal.¹⁴²

94. The scientific evidence shows that the hydraulic works generated the fragmentation of the bofedals. This resulted in the reduction of the potential area of typical bofedal species and increased soil compaction that reduces the

¹⁴¹ FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 6. **BR, Vol. 3, Annex 23.3.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

¹⁴² Image 3, Appendix C, p. 52. **BR, Vol. 6, Annex 29.** See also FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 15. **BR, Vol. 3, Annex 23.3.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

capacity of water retention.¹⁴³ Also, the hydraulic works drastically homogenized the aquatic habitat, reducing the number of groups of macro-invertebrates that typically inhabit such bofedals.¹⁴⁴ The drainage mechanisms and canalization works continuously collected the water that the Silala bofedals naturally irrigated, modifying the natural hydrological conditions of the area, causing the desiccation of soils and changes in vegetation. The process of invasion of scrubland and meadow species is a result of this draining process.¹⁴⁵ The Silala bofedals require restoration measures to recover their biodiversity, general physiognomic aspect, and ecosystemic functions.¹⁴⁶

95. The Ramsar Convention, to which both States are Party, promotes coordination among states for the conservation of wetlands, which translates into the cooperation that must exist between States. The conservation and restoration of the Silala wetlands, located in Bolivian territory, entails the cooperation that must exist between Bolivia and Chile. Within the framework of Ramsar regulations, it has been established that:

¹⁴³ FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 104. **BR, Vol. 3, Annex 23.3.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

¹⁴⁴ FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 104. **BR, Vol. 3, Annex 23.3.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

¹⁴⁵ FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 55. **BR, Vol. 3, Annex 23.3.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

¹⁴⁶ FUNDECO, Study of Evaluation of Environmental Impacts in the Silala, 2018, p. 102. **BR, Vol. 3, Annex 23.3.** DHI, Technical Analysis and Independent Validation Opinion of Supplementary Technical Studies Concerning the Silala Springs, December 2018. **BR, Vol. 2, Annex 23.**

“[...] the Convention has recognized and responded to the need to manage wetlands as part of river basins, so has the interpretation of international cooperation been expanded to include those situations where a wetland in one Contracting Party is within the water catchment of another Contracting Party and where the actions of the Contracting Parties within the catchment area may result in changes to the ecological character of the wetland”.¹⁴⁷

96. Given that the Bolivian wetlands of Silala (the North and South Bofedals) are located in the transboundary ravine of Silala, international cooperation should prevail to pursue preservation and restoration as mutual benefit guiding the relations between the two States, as they already did in the past.

2.2. The Need to Return to Cooperation and Agreed Formulas of Mutual Benefit

97. In 2001, Chile’s Foreign Minister, Soledad Alvear, stated that the Ministry of Foreign Affairs of her country proposed working with a practical agenda that ensures financial benefits for Bolivia.¹⁴⁸ This intention was reflected in the Minutes of the Eighteenth Meeting of the Bolivia-Chile Political Consultation Mechanism, where the Parties agreed that “in the next 60 days, the contents will be exchanged for an immediate basic agreement, that takes into account the water resource in its existing uses, the rights of each country, and the means of use in order to generate economic benefits for Bolivia.”¹⁴⁹

¹⁴⁷ International Cooperation: Guidelines and other support for international cooperation under the Ramsar Convention on Wetlands, Handbook 20, *Ramsar Handbooks*, 4th ed., p.10. Available at <https://bit.ly/2PPLdYj> ; See also Article 5 of the Convention on Wetlands of International Importance especially as Waterfowl Habitat, Ramsar, Iran, 2 February 1971.

¹⁴⁷ CM, para. 2.22.

¹⁴⁸ El Mercurio, The Foreign Minister Opts for Integration, Santiago, 21 October 2001. **BR, Vol. 2, Annex 21.**

¹⁴⁹ Minutes of the XVIII Meeting of the Bolivia-Chile Political Consultation Mechanism, 17 June 2008. **BCM, Vol. 2, Annex 6.**

98. In 2008, during the diplomatic negotiations within the framework of the Bolivia-Chile Working Group on the Silala Issue, Chile and Bolivia agreed: a) that joint technical studies should produce results acceptable to both Parties¹⁵⁰, b) that the waters would be exploited for “mutual benefit”¹⁵¹, and c) to find a satisfactory framework for both countries.¹⁵²
99. In the Initial Agreement on Silala Draft presented by the Parties in July 2009, Bolivia and Chile agreed on a modality of use of the Silala waters, focused on the mutual benefit that both States should enjoy. This preliminary agreement determined that: a) The use of Silala waters freely available to Bolivia, captured in its territory and transported to Chile, had to be compensated to Bolivia by Chilean legal entities; b) a percentage (50%) of the Silala surface water corresponds to Bolivia and is freely available and that this percentage can be increased on the basis of future studies, and c) Bolivia must give its authorization for its freely available waters to be used in Chilean territory and any dispute that may arise between the Chilean legal entity and Bolivia must be resolved in accordance with Bolivian regulations and before Bolivian authorities.¹⁵³

¹⁵⁰ Minutes of the IV Meeting of the Bolivia-Chile Working Group on the Silala Issue, 14 November 2008. **BCM, Vol. 2, Annex 7.**

¹⁵¹ Minutes of the XIV Meeting of the Bolivia-Chile Political Consultation Mechanism, 5 and 6 October 2005. **BR, Vol. 2, Annex 19.**

¹⁵² Minutes of the XIV Meeting of the Bolivia-Chile Political Consultation Mechanism, 5 and 6 October 2005. **BR, Vol. 2, Annex 19.** Minutes of the Second Meeting of the Mechanism for Political Consultations Bolivia Chile on the Silala Issue, 17 July 2006. **CM, Vol. 2, Annex 22.**

¹⁵³ Initial Agreement [Silala or Siloli], Agreed Draft, 28 July 2009. **BCM, Vol. 2, Annex 8.**

FINAL CONCLUSIONS

100. If Bolivia were to remove the drainage mechanisms and the artificial channels, and upon the disappearance of the artificial component of the watercourse, there would no longer be any dispute between the Parties on Bolivia's Counter-Claims b) and c). These Counter-Claims only refer to the artificial flow of Silala waters engineered, enhanced, or produced in its territory. Contrary to Chile's assertion, Counter-Claim c) relates to the conclusion of an agreement between the parties on the conditions and modalities of future delivery of artificially-flowing Silala waters from Bolivia to Chile. An agreement would no longer be necessary if the canals are dismantled.
101. In its Reply, Chile recognizes that the dispute "has been very significantly reduced as compared to when Chile decided to lodge its Application in June 2016"¹⁵⁴. Chile's acknowledgment concerns the totality of the dispute, and therefore cannot be assessed in isolation from the merits of the case.
102. Chile fully agrees with Bolivia's Counter-Claim a) and submits that there is no longer a dispute between the Parties on this issue, and asks the Court to adjudge and declare that "(a) [t]he Court lacks jurisdiction over Bolivia's Counter-Claim a), alternatively, Bolivia's Counter-Claim a) is moot, or is otherwise rejected". In principle, and as explained in this Rejoinder, Bolivia welcomes Chile's recognition of Bolivia's rights, however, and to the extent that its meaning in the particular circumstances of the case remains unclear, the Court is not in a position to accept Chile's request.

¹⁵⁴ CR, paras. 1.3 and 1.16.

103. For its part, Bolivia recognizes that, once the artificial channels and drainage mechanisms in Bolivian territory are removed, the Silala waters will be entirely governed by customary international law applicable to international watercourses.¹⁵⁵ This, in turn, will lead to a further reduction of Chile's Submissions and the main dispute as originally instituted by Chile in 2016. These new circumstances could render any pronouncement by the Court no longer necessary.

¹⁵⁵ BCM, paras.14 and 79.

SUBMISSIONS

With respect to the Counter-Claims presented by the Plurinational State of Bolivia, Bolivia requests the Court to adjudge and declare that:

- a) Bolivia has sovereignty over the artificial channels and drainage mechanisms in the Silala that are located in its territory and has the right to decide whether and how to maintain them;
- b) Bolivia has sovereignty over the artificial flow of Silala waters engineered, enhanced, or produced in its territory and Chile has no right to that artificial flow;
- c) Any delivery from Bolivia to Chile of artificially-flowing waters of the Silala, and the conditions and modalities thereof, including the compensation to be paid for said delivery, are subject to the conclusion of an agreement with Bolivia.

The Hague, 15 May 2019

Eduardo RODRÍGUEZ VELTZÉ
Agent of the Plurinational State of Bolivia

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CERTIFICATION

I have the honour to certify that this Rejoinder and the documents annexed in Volume 2-6, are true copies and conform to the original documents and that the translations into English made by the Plurinational State of Bolivia are accurate translations.

Eduardo RODRÍGUEZ VELTZÉ

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