Exhibit A

INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES
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CERTIFICATE

PERENCO ECUADOR LIMITED

v.

REPUBLIC OF ECUADOR

(ICSID CASE NO. ARB/08/6)

I hereby certify that the attached documents are true copies of the English and Spanish versions of the Tribunal's Award dated September 27, 2019.

Martina Polasek
Acting Secretary-General

Washington, D.C., September 27, 2019

INTERNATIONAL CENTRE FOR SETTLEMENT OF INVESTMENT DISPUTES
WASHINGTON, D.C.

In the arbitration proceeding between

PERENCO ECUADOR LIMITED

Claimant

and

THE REPUBLIC OF ECUADOR

Respondent

ICSID Case No. ARB/08/6

AWARD

Members of the Tribunal
H.E. Judge Peter Tomka, President
Mr. Neil Kaplan, C.B.E., QC, SBS
Mr. J. Christopher Thomas, QC

Secretary of the Tribunal
Mr. Marco Tulio Montañés-Rumayor

Date of dispatch to the Parties: 27 September 2019

REPRESENTATION OF THE PARTIES

Representing Perenco Ecuador Limited:

Mr. Mark W. Friedman
Ms. Ina C. Popova
Ms. Floriane Lavaud
Ms. Laura Sinisterra
Ms. Sarah Lee
Debevoise & Plimpton LLP
919 Third Avenue
New York, NY 10022
United States of America

Representing the Republic of Ecuador:

Procuraduría General del Estado
Dr. Íñigo Salvador Crespo – Procurador General del Estado (from August 2018); preceded by Dr. Rafael Parreño Navas, Procurador General del Estado (February 2018 – August 2018); and Dr. Diego García Carrión, Procurador General del Estado (April 2008 – January 2018).

Dr. Claudia Salgado Levy – Directora Nacional de Asuntos Internacionales y Arbitraje (from August 2018); preceded by Dra. Blanca Gómez de la Torre (June 2013 – July 2018); preceded by Dra. Christel Gaibor Flor (March 2012 – May 2013); preceded by Dr. Francisco Grijalva (May 2011 – February 2012); preceded by Dr. Álvaro Galindo (August 2008 – April 2011); and preceded by Dr. Carlos Venegas (April 2008 – July 2008).

Ms. Nazaret Ramos – Subdirectora de Asuntos Internacionales (from March 2019); preceded by Dra. Christel Gaibor (April 2008 – February 2019).

Ms. Diana Moya Dávalos – attorney PGE (from July 2013).
Mr. Gary López Vélez – attorney abogado PGE (June 2017 – December 2018).
Mr. Francisco Larrea – attorney PGE (March 2011 – June 2013).
Ms. Gianina Osejo – attoreny PGE (September 2009 – May 2012).
Mr. Agustin Acosta – attorney PGE (May 2010 – June 2011).
Mr. Francisco Paredes Balladares – attorney PGE (September 2009 – January 2011).
Dr. Claudia Salgado Levy – attorney PGE (April 2008 – August 2009).

Prof. Eduardo Silva Romero
Mr. José Manuel García Represa
Mr. Philip Dunham
Mr. Alvaro Galindo
Ms. Maria Claudia Procopiak
Ms. Audrey Caminades
Ms. Gabriela González Giráldez
Dechert LLP
32 rue de Monceau
75008 Paris, France

Profesor Pierre Mayer
20 rue des Pyramides
75001 Paris, France

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FREQUENTLY USED ABBREVIATIONS AND ACRONYMS

[CA] [EL]	Legal Authority [Claimant] [Respondent]
[CE] [E]	Exhibit [Claimant] [Respondent]
Amended Request for Arbitration	Claimant's Amended Request for Arbitration, dated 18 July 2008
Arbitration Rules	ICSID Rules of Procedure for Arbitration Proceedings (2006)
BIT or the Treaty	Agreement between the Republic of France and the Republic of Ecuador Concerning the Encouragement and Reciprocal Protection of Investment
Brattle ER II	The Brattle Group Expert Report, prepared by James Dow and Richard Caldwell, dated 4 May 2015 (
Brattle ER III	The Brattle Group Expert Report, prepared by James Dow and Richard Caldwell, dated 16 October 2015
Cl. PHB Q.	Claimant's Post Hearing Brief on Quantum, dated 29 January 2016
Cl. Rep. M.	Claimant's Reply to Respondent's Counter-Memorial, dated 12 April 2012
Cl. Rep. PHB Q.	Claimant's Reply Post Hearing Brief on Quantum, dated 29 February 2016
Combe WS II	Witness Statement of Laurent Combe, dated 19 December 2014
Combe WS III	Witness Statement of Laurent Combe, dated 24 July 2015
Consolidated Expert Report	Parties Annotated Comments on the Independent Expert Report
Resp. C-Mem. Q.	Respondent's Counter-Memorial on Quantum, dated 4 May 2015
Crick WS II	Witness Statement of John Crick, dated 19 December 2014
Crick WS III	Witness Statement of John Crick, dated 24 July 2015

d'Argentré WS IV	Witness Statement of Eric d'Argentré, dated 3 July 2013
d'Argentré WS V	Witness Statement of Eric d'Argentré, dated 19 December 2014
d'Argentré WS VI	Witness Statement of Eric d'Argentré, dated 24 July 2015
Decision on Jurisdiction	Decision on Jurisdiction, dated 30 June 2011
Decision on Liability	Decision on Remaining Issues on Jurisdiction and on Liability, dated 12 September 2014
Decision on Perenco's First Dismissal Application	Decision on Perenco's Application for Dismissal of Ecuador's Counterclaims, dated 18 August 2017
Decision on Provisional Measures	Decision on Provisional Measures, dated 8 May 2009
Decision on Reconsideration	Decision on Ecuador's Reconsideration Motion, dated 10 April 2015
Ecuador or the Respondent	Republic of Ecuador
First Dismissal Application	Claimant's Application to Dismiss the Counterclaims, dated 18 April 2017
GSI ER I	GSI Environmental Inc. Expert Report, dated 20 September 2012
GSI ER II	GSI Environmental Inc. Expert Report, dated 12 July 2013
ICSID Convention	Convention on the Settlement of Investment Disputes Between States and Nationals of Other States, dated 18 March 1965
ICSID or the Centre	International Centre for the Settlement of Investment Disputes
Independent Expert	Mr. Scott MacDonald, from Ramboll, appointed as the Tribunal's independent expert by Procedural Order No. 16, dated 6 July 2016
Independent Expert Report or Report	Mr. Scott MacDonald's Expert Report, dated 19 December 2018

Interim Decision on Counterclaim	Interim Decision on the Environmental Counterclaim, dated 11 August 2015
Intertek I	Expert Report of Geoffrey R. Egan, Intertek, dated 28 September 2012
Intertek II	Expert Report of Geoffrey R. Egan, Intertek, dated 3 July 2013
JOAs	Novation of Joint Operating Agreement in respect of Block 7, Oriente Basin, Ecuador, dated 12 December 2002 (Exhibit CE-31), and Novation of Joint Operating Agreement in respect of Block 21, Oriente Basin, Ecuador, dated 12 December 2002 (CE-32)
Kalt ER III	Expert Report of Joseph P. Kalt, dated 19 December 2014
Kalt ER IV	Expert Report of Joseph P. Kalt, dated 24 July 2015
Loose ER VI	Expert Report of Hernan Perez Loose, dated 19 December 2014
Loose ER VII	Expert Report of Hernan Perez Loose, dated 24 July 2015
Luna WS III	Witness Statement of Pablo Luna, dated 22 February 2013
Memorial/Cl. Mem. Q	Claimant's Memorial on Quantum, dated 19 December 2014
Palacios WS I	Witness Statement of Derlis Palacios, dated 30 November 2011
Palacios WS III	Witness Statement of Derlis Palacios, dated 23 July 2012
Participation Contracts/PSCs	Participation Contracts for Blocks 7 and 21 (Exhibit CE-17/CE-CC-28: Block 7 and Exhibit CE-10/CE-CC-13: Block 21)
Parties	Claimant and the Respondent
Perenco or the Claimant	Perenco Ecuador Limited

Pinto WS I	Witness Statement of Germánico Pinto, dated 28 November 2011
Pinto WS II	Witness Statement of Germánico Pinto, dated 25 July 2012
Quantum Closing	Quantum Closing hearing held in The Hague on 21 April 2016
Quantum Hearing	Hearing on Quantum held in Paris from 9-13 November 2015
Quantum Rejoinder	Respondent's Rejoinder on Quantum, dated 16 October 2015
Quantum Reply/Cl. Rep. Q.	Claimant's Reply on Quantum, dated 24 July 2015
Rejoinder	Ecuador's Rejoinder to Perenco's Second Application to Dismiss Ecuador's Counterclaims, dated 26 April 2018
Reply	Perenco's Reply in Support of its Second Application to Dismiss Ecuador's Counterclaims, dated 5 April 2018
Request for Arbitration	Claimant's Request for Arbitration, dated 30 April 2008
Resp. PHB Q.	Respondent's Post Hearing Brief on Quantum, dated 29 January 2016
Resp. Rep. PHB Q.	Respondent's Reply Post Hearing Brief on Quantum, dated 29 February 2016
Resp. PHB CC	Respondent's Post-Hearing Brief on Counterclaims, dated 6 November 2013
Response	Ecuador's Response to Perenco's Second Application to Dismiss Ecuador's Counterclaims, dated 15 March 2018
RPS ER IV	Expert Report of RPS, dated 4 May 2015
RPS ER V	Expert Report of RPS, dated 16 October 2015
Saltos WS I	Witness Statement of Wilfrido Saltos, dated 28 September 2012
Second Dismissal Application	Perenco's Second Application to Dismiss Ecuador's Counterclaims, dated 30 January 2018

Settlement Agreement	Settlement agreement between Burlington and Ecuador, dated 1 December 2017
Strickland ER I	Expert Report of Richard F. Strickland, dated 19 December 2014
Strickland ER II	Expert Report of Richard F. Strickland, dated 24 July 2015
Tr. (day) (MacDonald) (date) [page:line]	Transcript of the Independent Expert Hearing held in The Hague from 11-12 March 2019
Tr. [J.] [P.M.] [M.][page:line]	Transcript of the hearing on jurisdiction / on provisional measures / hearing on merits
Tr. Q. (day) [page:line]	Transcript of the Hearing on Quantum held in Paris from 9-13 November 2015
Tr. Q. (6) [page:line]	Transcript of the Quantum Closing hearing held in The Hague on 21 April 2016

I. INTRODUCTION

A. Parties

1. The Claimant is Perenco Ecuador Limited and is hereinafter referred to as "**Perenco**" or the "**Claimant**."

2. The Respondent is the Republic of Ecuador and is hereinafter referred to as "**Ecuador**" or the "**Respondent**."

3. The Claimant and the Respondent are hereinafter collectively referred to as the "**Parties**." The Parties' respective representatives and their addresses are listed above on page (i).

B. Procedural History

4. On 30 June 2011, the Tribunal issued its Decision on Jurisdiction ("**Decision on Jurisdiction**").

5. On 12 September 2014, the Tribunal issued its Decision on Remaining Issues on Jurisdiction and on Liability ("**Decision on Liability**").

6. On 26 November 2014, the Tribunal issued Procedural Order No. 12 fixing the calendar for the quantum phase.

7. In accordance with the calendar, on 19 December 2014, the Claimant filed its Memorial on Quantum ("**Memorial"**). It was accompanied by the witness statements of Messrs. Didier Lafont, Laurent Combe, John Crick, Rodrigo Márquez Pacanins, and François Perrodo (all second witness statements) and Mr. Eric d'Argentré (fifth witness statement); and the expert reports of Dr. Richard Strickland (first expert report), Professor Joseph P. Kalt (third expert report), and Dr. Hernán Perez Loose (sixth expert report).

8. On 10 March 2015, the Tribunal issued Procedural Order No. 13 regarding the Respondent's request for production of documents.

9. On 10 April 2015, the Tribunal issued its Decision on Ecuador's Reconsideration Motion ("**Decision on Reconsideration**").

10. On 4 May 2015, the Respondent filed its Counter-Memorial on Quantum ("**Counter-Memorial"**). It was accompanied by the witness statements of Messrs. Christian Dávalos (fifth witness statement) and Gabriel Freire (first witness statement); and the expert reports of Professor Juan Pablo Aguilar (sixth expert report); The Brattle Group (second expert report); and RPS (fourth expert report).

11. On 12 June 2015, the Tribunal issued Procedural Order No. 14 regarding the Claimant's request for production of documents.

12. On 24 July 2015, the Claimant filed its Reply on Quantum ("**Quantum Reply**"). It was accompanied by the witness statements of Messrs. Laurent Combe, John Crick and Rodrigo Márquez Pacanins (all third witness statements), and Mr. Eric d'Argentré (sixth witness statement); and the expert reports of Dr. Richard Strickland (second expert report), Professor Joseph P. Kalt (fourth expert report), and Dr. Hernán Perez Loose (seventh expert report).

13. On 11 August 2015, the Tribunal issued its Interim Decision on the Environmental Counterclaim ("**Interim Decision on Counterclaim**").

14. On 16 October 2015, the Respondent filed its Rejoinder on Quantum ("**Quantum Rejoinder**"). It was accompanied by the expert reports of Professor Juan Pablo Aguilar (seventh expert report), The Brattle Group (third expert report), and RPS (fifth expert report).

15. On 23 October 2015, the Tribunal issued Procedural Order No. 15 concerning the organization of the hearing on quantum.

16. A hearing on quantum was held in Paris from 9-13 November 2015 ("**Quantum Hearing**"). Present at the hearing were:

Tribunal

H.E. Judge Peter Tomka	President
Mr. Neil Kaplan CBE QC SBS	Co-Arbitrator
Mr. J. Christopher Thomas QC	Co-Arbitrator

Assistants to the Tribunal Members:

Ms. Lucille Kante	Assistant to Mr. Neil Kaplan CBE QC SBS
Ms. Emily Choo Wan Ning	Assistant to Mr. J. Christopher Thomas QC

ICSID Secretariat

Mr. Marco Tulio Montañés-Rumayor	Secretary of the Tribunal

For the Claimant:

Counsel

Mr. Mark W. Friedman	Debevoise & Plimpton LLP
Ms. Ina C. Popova	Debevoise & Plimpton LLP
Mr. Thomas H. Norgaard	Debevoise & Plimpton LLP
Ms. Terra L. Gearhart-Serna	Debevoise & Plimpton LLP
Ms. Z.J. Jennifer Lim	Debevoise & Plimpton LLP
Ms. Laura Sinisterra	Debevoise & Plimpton LLP

Support Personnel

Ms. Prasheela Vara	Debevoise & Plimpton LLP
Mr. Sébastien Darid	Debevoise & Plimpton LLP
Mr. Gaspard de Monclin	Debevoise & Plimpton LLP
Ms. Sarah Lee	Harvard Law School

Parties

Mr. Roland Fox	Perenco
Mr. François Hubert Marie Perrodo	Perenco

Witnesses

Mr. Laurent Combe	Perenco
Mr. John Crick	Perenco
Mr. Eric d'Argentré	Perenco
Mr. Didier Lafont	Petroceltic
Mr. Rodrigo Márquez Pacanins	MQZ Renewables
Mr. François Hubert Marie Perrodo	Perenco

Experts

Prof. Joseph P. Kalt	Compass Lexecon
Mr. Stephen Makowka	Compass Lexecon
Dr. Hernán Pérez Loose	Coronel y Pérez Abogados
Dr. Richard F. Strickland	The Strickland Group

For the Respondent:

Parties	
Dr. Procurador Diego Carrión García	Procuraduría General del Estado
Dra. Blanca Gómez de la Torre	Procuraduría General del Estado
Ms. Diana Moya	Procuraduría General del Estado
Counsel	
Prof. Eduardo Silva Romero	Dechert (Paris) LLP
Prof. Pierre Mayer	-
Mr. José Manuel García Represa	Dechert (Paris) LLP
Mr. Timothy Lindsay	Dechert (Paris) LLP
Ms. Maria Claudia Procopiak	Dechert (Paris) LLP
Ms. Gabriela González Giráldez	Dechert (Paris) LLP
Mr. David Attanasio	Dechert (Paris) LLP
Ms. Mónica Garay	Dechert (Paris) LLP
Mr. Antonio Gordillo	Dechert (Paris) LLP
Ms. Ruxandra Esanu	Dechert (Paris) LLP
Ms. Maria Quijada	Dechert (Paris) LLP
Ms. Katherine Marami	Dechert (Paris) LLP
Ms. Djamila Rabhi	Dechert (Paris) LLP
Ms. Peggy Alvarez Varas	Dechert (Paris) LLP
Ms. Sara María Moreno Sánchez	Dechert (Paris) LLP
Ms. Verena Wieditz	Dechert (Paris) LLP
Ms. Antonia Pascali	
Witnesses	
Mr. Christian Dávalos	Witness
Mr. Gabriel Freire	Witness
Experts	
Mr. Juan Pablo Aguilar	Universidad San Francisco de Quito
Mr. Gene Wiggins	RPS Knowledge Reservoir
Mr. Sheldon Gorell	RPS Knowledge Reservoir
Prof. James Dow	The Brattle Group
Mr. Richard Caldwell	The Brattle Group
Mr. Tom Dorrington Ward	The Brattle Group

17. Interpretation to and from English and Spanish was provided. The Quantum Hearing was also sound-recorded and transcribed verbatim, in real time, in both English and Spanish. Copies of the sound recordings and the transcripts were delivered to the Parties.

18. At the end of the Quantum Hearing, the Tribunal and the Parties held a procedural discussion in relation to post-hearing matters. After consulting with the Parties, the Tribunal fixed a calendar for post-hearing submissions, including a hearing on closing arguments.

19. On 29 January 2016, the Parties filed their Post-Hearing Briefs ("**PHBs"**) pursuant to Procedural Order No. 15.

20. On 29 February 2016, the Parties filed their Reply Post-Hearing Briefs ("**Reply PHBs**").

21. A hearing on closing arguments was held at The Hague on 21 April 2016 (**"Quantum Closing**"). Present at the hearing were:

Tribunal

H.E. Judge Peter Tomka	President
Mr. Neil Kaplan CBE QC SBS	Co-Arbitrator
Mr. J. Christopher Thomas QC	Co-Arbitrator

Assistants to the Tribunal Members:

Ms. Lucille Kante	Assistant to Mr. Neil Kaplan CBE QC SBS
Ms. Emily Choo Wan Ning	Assistant to Mr. J. Christopher Thomas QC

ICSID Secretariat

Mr. Marco Tulio Montañés-Rumayor	Secretary of the Tribunal

For the Claimant:

Counsel	
Mr. Mark W. Friedman	Debevoise & Plimpton LLP
Ms. Ina C. Popova	Debevoise & Plimpton LLP
Ms. Z.J. Jennifer Lim	Debevoise & Plimpton LLP
Ms. Laura Sinisterra	Debevoise & Plimpton LLP
Support Personnel	
Ms. Mary Grace McEvoy	Debevoise & Plimpton LLP
Parties	
Mr. Roland Fox	Perenco

For the Respondent:

Parties	
Dr. Procurador Diego Carrión García	Procuraduría General del Estado
Dra. Blanca Gómez de la Torre	Procuraduría General del Estado
Ms. Diana Moya	Procuraduría General del Estado
Counsel	
Mr. Eduardo Silva Romero	Dechert (Paris) LLP
Mr. Pierre Mayer	
Mr. Philip Dunham	Dechert (Paris) LLP
Mr. José Manuel García Represa	Dechert (Paris) LLP
Ms. Maria Claudia Procopiak	Dechert (Paris) LLP
Mr. David Attanasio	Dechert (Paris) LLP
Ms. Ruxandra Esanu	Dechert (Paris) LLP
Expert	
Mr. Richard Caldwell	The Brattle Group

22. On 6 July 2016, the Tribunal issued Procedural Order No. 16 concerning the appointment of Mr. Scott MacDonald as the Tribunal's independent expert ("**Independent Expert**") pursuant to the Interim Decision on Counterclaim.

23. From 1 November 2016 to 5 November 2016, the Parties and the Independent Expert visited the place connected with the dispute relating to the environmental counterclaim pursuant to ICSID Arbitration Rule 37(1).

24. On 18 April 2017, Perenco filed an application to dismiss the environment and infrastructure counterclaims ("**First Dismissal Application**").

25. On 23 May 2017, Ecuador filed its observations on Perenco's First Dismissal Application.

26. On 12 June 2017, Perenco filed a reply on its First Dismissal Application.

27. On 4 July 2017, Ecuador filed a rejoinder on Perenco's First Dismissal Application.

28. On 18 August 2017, the Tribunal issued its Decision on Perenco's Application for Dismissal of Ecuador's Counterclaims ("**Decision on Perenco's First Dismissal Application**").

29. On 30 January 2018, Perenco filed a second application to dismiss the counterclaims ("**Second Dismissal Application**").

30. On 15 March 2018, Ecuador filed observations on Perenco's Second Dismissal Application ("**Response**").

31. On 5 April 2018, Perenco filed a reply on its Second Dismissal Application ("**Reply**").

32. On 27 April 2018, Ecuador filed a rejoinder on the Claimant's Second Dismissal Application ("**Rejoinder**").

33. On 30 July 2018, the Tribunal informed the Parties of its decision, by a majority, to reject Perenco's Second Dismissal Application, with reasons to be given in the Award.

34. On 19 December 2018, the Independent Expert issued his report ("**Independent Expert Report**" or "**Report**").

35. On 20 December 2018, Perenco filed a request for the Tribunal to decide on production of documents.

36. On 2 January 2019, Ecuador filed observations on Perenco's request for the Tribunal to decide on production of documents.

37. On 15 January 2019, the Tribunal issued Procedural Order No. 17 concerning production of documents.

38. On 6 February 2019, the Tribunal issued Procedural Order No. 18 concerning the organization of the hearing on the Independent Expert Report.

39. On 23 February 2019, the Parties filed their observations on the Independent Expert Report.

40. On 11 to 12 March 2019, a hearing on the Independent Expert Report was held in The Hague ("**Expert Hearing**"). Present at the hearing were:

Tribunal

H.E. Judge Peter Tomka	President
Mr. Neil Kaplan CBE QC SBS	Co-Arbitrator
Mr. J. Christopher Thomas QC	Co-Arbitrator

Assistant:

Ms. Emily Choo Wan Ning	Assistant to Mr. J. Christopher Thomas QC

Tribunal's Independent Expert

Mr. Scott MacDonald	Tribunal's Expert, Ramboll
Mr. Jose Sananes	Ramboll

ICSID Secretariat

Mr. Marco Tulio Montañés-Rumayor	Secretary of the Tribunal

For the Claimant:

Counsel

Mr. Mark W. Friedman	Debevoise & Plimpton LLP
Ms. Ina C. Popova	Debevoise & Plimpton LLP
Ms. Laura Sinisterra	Debevoise & Plimpton LLP
Ms. Sarah Lee	Debevoise & Plimpton LLP

Ms. Mary Grace McEvoy	Debevoise & Plimpton LLP
Ms. Anisha Sud	King & Spalding LLP
Parties	
Mr. Jonathan Parr	Perenco
Ms. Josselyn Briceno	Perenco
Ms. Samita Mehta	ConocoPhillips
Experts	
Mr. John Connor	GSI
Mr. Gino Bianchi	GSI

For the Respondent:

Counsel	
Prof. Eduardo Silva Romero	Dechert (Paris) LLP
Mr. José Manuel García Represa	Dechert (Paris) LLP
Mr. Philip Dunham	Dechert (Paris) LLP
Ms. Maria Claudia Procopiak	Dechert (London) LLP
Ms. Gabriela González Giráldez	Dechert (Paris) LLP
Support Personnel	
Mr. Ricardo Montalvo Lara	Dechert (Paris) LLP
Ms. Anne Driscoll	Dechert (Paris) LLP
Parties	
Dr. Iñigo Salvador Crespo	Attorney General for the Republic of Ecuador
Dra. Claudia Salgado Levy	National Director of International Litigation and Arbitration at Attorney General Office of Ecuador
Experts	
Mr. José Francisco Alfaro Rodriguez	IEMS
Mr. Scott Crouch	DiSorbo (formerly at RPS)
Ms. Martha Pertusa	TRC Environmental (formerly at RPS)

41. On 19 April 2019, the Parties filed their submissions on costs.

42. On 10 May 2019, the Parties filed their reply submissions on costs.

43. The Tribunal deliberated in person at several meetings (held on the following dates: 24-26 April 2016, 26-27 November 2016, 10-11 June 2017, 25-26 November 2017, 27-28 January 2018, 13-15 March 2019, and 3 June 2019) as well as by other means.

44. On 30 August 2019, the Tribunal declared the proceeding closed pursuant to ICSID Arbitration Rule 38(1).

C. General Remarks

45. The Tribunal acknowledges at the outset that this arbitration has taken a very long time. However, there are many reasons for this which the Tribunal believes are worth noting at the outset.

46. Two key reasons arose from the damages estimates in both the primary claim and in the environmental and infrastructure counterclaims. With respect to the former, the Tribunal concluded after the Quantum Hearing that consideration of the damages claimed by Perenco required further in-depth work and the adjustment of the financial models that had been used by the Parties' experts during the quantum phase.

47. In the counterclaims proceedings, which continued separately, the Parties were requested to attempt to negotiate a settlement based on the findings of law and fact made in the Tribunal's Interim Decision on Counterclaim, failing which the Tribunal would appoint an independent expert to assist in evaluating Blocks 7 and 21 ("**Blocks**") and estimating any environmental damage assessed in accordance with the Interim Decision on Counterclaim. A negotiated settlement proved not to be possible. It took the Parties some time to jointly identify a suitable independent expert who could be appointed by the Tribunal, as contemplated in the Interim Decision on Counterclaim.

48. This Independent Expert was to assess the work performed by the Parties' experts and to conduct further sampling in Ecuador in accordance with the Tribunal's findings set out in the Interim Decision on Counterclaim. This work was conducted from August to mid-December 2017 and the Independent Expert Report was not received until 19 December 2018. Thereafter, the Tribunal gave the Parties an opportunity to insert comments into the Independent Expert Report as well as to submit general comments on his work, and convened a two-day hearing in The Hague at which the Independent Expert provided a 90-minute presentation of his findings and responded to the Parties' written comments, after which the Parties were given opportunities to put questions to the Independent Expert. The

Tribunal then deliberated in respect of the counterclaims, considered the Parties' submissions on costs, and finalised this Award.

49. In light of the foregoing, in the Tribunal's view, it made sense to deal with all outstanding damages issues in a single Award.

50. The Tribunal acknowledges that this has been too slow a process for at least one of the Parties, but when substantial amounts have been claimed (approximately US$1.5 billion in the principal claim and US$2.5 billion in the counterclaim), careful consideration and due deliberation is required.

51. Relatedly, the Tribunal considers it appropriate to recount the principal steps taken in this long arbitration:

(a) The Request for Arbitration was filed on 30 April 2008.

(b) This was registered on 4 June 2008.

(c) An Amended Request for Arbitration was filed on 28 July 2008.

(d) The Tribunal was constituted on 21 November 2008.

(e) The first session was held on 7 February 2009.

(f) The Request for Provisional Measures was filed on 19 February 2009.

(g) A hearing on provisional measures was held in Paris on 19 March 2009 which resulted in a 41-page decision of the Tribunal on 8 May 2009 ("**Decision on Provisional Measures**").

(h) One arbitrator resigned on 16 December 2009 and the proceedings were suspended. The arbitrator was replaced by Mr. Neil Kaplan CBE QC SBS on 13 January 2010.

(i) The late Lord Bingham, who presided over the first phase of the arbitration, resigned due to ill health on 17 February 2010. H.E. Judge Peter Tomka was appointed by the Chairman of the Administrative Council on 6 May 2010.

(j) A hearing on jurisdiction was held in The Hague on 2-4 November 2010. The Tribunal rendered its first Decision on Jurisdiction, some 44 pages, on 30 June 2011.

(k) While the primary claim was in train, on 5 December 2011, Ecuador filed counterclaims for alleged environmental harm and infrastructure damages. This was fully briefed by the Parties and a hearing was held in The Hague commencing 9 September 2013 and concluding on 17 September 2013.

(l) After further briefing by the Parties, the hearing on the merits of the primary claim coupled with the remaining jurisdictional issues which had been set over to the

merits phase, was heard in The Hague commencing on 8 November 2012 and concluding on 16 November 2012. The Decision on Liability, running to 234 pages, was dispatched to the Parties on 12 September 2014. Some delay in the rendering of this decision was occasioned by the translation of the English original into Spanish.

(m) On 19 December 2014, Ecuador sought a reconsideration of the Tribunal's Decision on Liability. After receiving submissions from the Parties, the request was considered and then dismissed in a 24-page decision on 10 April 2015.

(n) On 11 August 2015, an Interim Decision on Counterclaim running to 187 pages and which also had to be translated into Spanish running to 211 pages was dispatched to the Parties.

(o) As noted above, the Tribunal instructed the Parties to consider the findings of law and fact made in the Interim Decision on Counterclaim with a view to encouraging them to negotiate a settlement in light of the Tribunal's findings. The Parties agreed to do so but were unable to arrive at a settlement. As a result, the Tribunal proceeded to act in accordance with the alternative process envisaged in the Interim Decision on counterclaim, namely, that it would appoint its own expert to evaluate the environmental condition of the two Blocks.

(p) The damages phase of this arbitration was heard for one week in Paris commencing 9 November 2015.

(q) The oral closing submissions on damages was heard in The Hague on 21 April 2016.

(r) Immediately following the closing submissions on damages, the Tribunal conducted its first set of in-person deliberations on quantum. In the course of doing so, it concluded that having regard to the work undertaken by the Parties' quantum experts up to closing submissions, the further elaboration of that work was in order and correspondence on this matter with the Parties ensued.

(s) Shortly after the Quantum Hearing for the primary claim, having consulted on the matter, on 25 April 2016, the Parties jointly proposed to the Tribunal the appointment of Mr. Scott MacDonald of Ramboll as the Tribunal-appointed expert to conduct the sampling contemplated by the Tribunal in the event that the Parties could not agree on a settlement of the environmental counterclaim. The Tribunal conferred with Mr. MacDonald as to how he would approach the exercise in light of the Tribunal's instructions laid out in the Interim Decision on Counterclaim.

(t) On 6 July 2016, Mr. MacDonald was appointed as the Tribunal's Independent Expert by Procedural Order No. 16.

(u) From 1 November 2016 to 5 November 2016, Mr. MacDonald visited Ecuador to inspect the two Blocks for purposes of working out his subsequent work plan.

(v) The Tribunal continued its quantum deliberations at a meeting held on 25 and 26 November 2016 and further analytical work ensued.

(w) On 7 February 2017, the *Burlington* tribunal rendered its Decision on Reconsideration and Award.[1] After reflection, the Tribunal decided to seek the Parties' views as to what, if anything, in that award was relevant to the Tribunal's consideration of the matters before it, given that Burlington and Perenco constituted the members of the Consortium which operated Blocks 7 and 21 and many of the facts are common to the two disputes. Submissions on the point were received from the Parties on 18 April 2017.

(x) Also on 18 April 2017, Perenco filed its First Dismissal Application. Perenco submitted with respect to the environmental and infrastructure counterclaim that the *Burlington* award was *res judicata* for the Parties to the present proceeding and thus the Tribunal's Interim Decision on Counterclaim had been overtaken by the *Burlington* tribunal's determinations of the Consortium's liability (as established in a claim brought by Ecuador against Perenco's fellow Consortium member and alleged privy, Burlington). It asserted that therefore the environmental expert's work should be terminated.

(y) The Tribunal laid down a schedule for further submissions on the point by both Parties, which was transmitted to the Parties on 3 May 2017, after the Parties failed to agree on a schedule.

(z) On 23 May 2017, Ecuador filed a response to Perenco's First Dismissal Application.

(aa) On 10 and 11 June 2017, the Tribunal held an in-person deliberation on quantum in The Hague.

(bb) On 13 June 2017, Perenco submitted a reply on Ecuador's response to Perenco's First Dismissal Application.

(cc) On 4 July 2017, Ecuador submitted a rejoinder thereto.

(dd) On 18 August 2017, the Tribunal dismissed Perenco's First Dismissal Application.

(ee) Meanwhile, starting on August 2017, Mr. MacDonald and his team began conducting field work at identified sites for the purpose of preparing the sampling activities.

(ff) On 30 January 2018, Perenco filed its Second Dismissal Application. This was on the basis that Burlington's settlement with Ecuador, and payment in full of Burlington and Perenco's joint debt on the counterclaims, extinguished whatever joint liability Perenco as well as Burlington had to Ecuador, and rendered Ecuador's further pursuit of the counterclaims moot.

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[1] *Burlington Resources Inc. v. Republic of Ecuador*, ICSID Case No. ARB/08/5, Decision on Reconsideration and Award, 7 February 2017 ("*Burlington* award"), CA-CC-60. The *Burlington* tribunal also issued on the same date a Decision on Counterclaims, CA-CC-59 ("*Burlington* Decision on Counterclaims") which was made an integral part of the *Burlington* award.

(gg) On 5 February 2018, following the Tribunal's invitation, Ecuador provided its comments on the Second Dismissal Application and proposed an alternative briefing schedule following the Parties' failure to agree on a briefing schedule.

(hh) On 8 February 2018 and on 12 February 2018, the Parties provided further comments on the way forward with the Second Dismissal Application.

(ii) On 15 February 2018, the Tribunal laid down the briefing schedule after considering the Parties' comments and decided that Mr. MacDonald's work was to continue. There would be no disclosure in relation to the application nor an oral hearing.

(jj) Pursuant to this, on 15 March 2018, Ecuador filed its response to Perenco's Second Dismissal Application.

(kk) On 5 April 2018, Perenco filed its Reply.

(ll) On 26 April 2018, Ecuador filed its Rejoinder.

(mm) On 30 July 2018, the Tribunal issued its Decision on Perenco's Second Dismissal Application, deciding, by a majority, to reject the application.

(nn) On 19 December 2018, after receiving the Independent Expert Report, the Tribunal dispatched it to the Parties to seek their comments thereon. After receiving the Parties' comments thereon, and as requested by the Parties, the Tribunal held a hearing on the Independent Expert Report on 11-12 March 2019. The Tribunal also met on 13-15 March 2019 and 3 June 2019 for the final in-person meetings.

(oo) On 19 April and 10 May 2019, the Tribunal received the Parties' costs submissions and reply costs submissions in the form requested by the Tribunal.

52. The following comments are *apropos*:

(a) There have been a total of 7 hearings in this case;

(b) The pleadings in this case have been voluminous and have run to not less than 3816 pages;

(c) There have been no less than 55 witness statements running to not less than 1028 pages excluding exhibits;

(d) The experts' reports in this case total 53. They run in total to no less than 2539 pages excluding exhibits;

(e) The evidential record in this arbitration, excluding the items listed above, exceeds 125,302 pages; and

(f) There have been numerous interlocutory skirmishes between the Parties, unfortunately caused by lack of agreement between them on a number of procedural issues, which have occupied the Tribunal's time.

53. As recorded above, since the completion of the written and oral pleadings, the Tribunal has deliberated in-person as well as by electronic means. This has been a complex and hard-

fought case. The Tribunal has considered all the points raised by the Parties even though it has only referred to the most important submissions and points for purposes of its Award.

54. **Part II** of this Award contains the Tribunal's assessment of the damages due to Perenco for the breaches of Treaty and contract. **Part III** contains the Tribunal's assessment of the damages payable by Perenco to Ecuador for the environmental damage caused by the Consortium's operations. **Part IV** contains the Tribunal's consideration of the infrastructure counterclaim by Ecuador. **Part V** contains the Tribunal's decision on the Parties' respective claims and submissions on costs. This Award follows on from the Tribunal's 30 June 2011 Decision on Jurisdiction, the 12 September 2014 Decision on Liability, the 10 April 2015 Decision on Reconsideration, the 11 August 2015 Interim Decision on Counterclaim, the decisions on Perenco's two requests for dismissal of the Respondent's counterclaims of 18 August 2017 and of 30 July 2018, and all of them should be read with and taken as an integral part of this Award.

II. DAMAGES CLAIMED IN RELATION TO THE BREACH OF THE TREATY AND THE PARTICIPATION CONTRACTS

A. The Parties' Positions in the Damages Phase

55. The damages phase follows from the Tribunal's Decision on Liability in which the *dispositif* declared that the following breaches had occurred: (i) breach of the Block 7 and 21 Participation Contracts[2] in respect of Law 42 at 99%, (ii) breach of the Block 21 Participation Contract as a result of the declaration of *caducidad*; (iii) breach of Article 4

[2] See Contract Modifying the Service Contract to a Participation for the Exploration and Exploitation of Hydrocarbons in Block 7 of the Amazon Region, including the Contract for the Coca-Payamino Unified Field ("**Block 7 Participation Contract**") and the Participation Contract for the Exploration and Exploitation of Hydrocarbons in Block 21 of the Amazon Region ("**Block 21 Participation Contract**"). Collectively referred to as the "**Participation Contracts"** or "**PSCs**."

of the Treaty[3] in respect of Law 42 at 99%, and (iv) breach of Article 6 of the Treaty as a result of the declaration of *caducidad*.[4]

1. The Claimant's Position

56. With Ecuador's responsibility having been engaged, Perenco initially requested an Award of US$1.572 billion in damages.[5]

57. Relying upon the testimony of Mr. John Crick (an advisor to the Chief Executive Officer of Perenco[6]), the expert reports of Dr. Richard Strickland, and the expert economic and financial reports of Professor Joseph Kalt of Compass Lexecon, Perenco claimed that it is entitled to US$1.572 billion, calculated on an *ex post* basis, to compensate it for its losses arising out of Ecuador's breaches of its international law and contractual obligations.

58. Perenco's Request for Arbitration had sought declarations that obligations under the Treaty and the Participation Contracts had been breached, an order that Ecuador declare null and void the relevant measures, the reinstatement of Perenco's rights under the Participation Contracts, an order that Ecuador abide by and perform the terms of the Participation Contracts, and damages.[7] Perenco had also sought Provisional Measures against Ecuador, seeking to restrain any action to collect Law 42 dues as well as any action to amend, rescind, terminate or repudiate the Participation Contracts.[8]

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3 Agreement between the Government of the French Republic and the Government of the Republic of Ecuador on the Reciprocal Promotion and Protection of Investments ("**Treaty**" or "**BIT**").

4 Decision on Liability, paragraph 606 and paragraph 713, in particular, paragraphs 713(4), (6), (8), (12) and (14). The Tribunal also found that certain acts of Ecuador taken between the application of Decree 662 and *caducidad* also violated the fair and equitable treatment standard.

5 Cl. Rep. Q., paragraph 278(b): updated proxy date of 1 July 2015 (and other adjustments).

6 Crick WS II, paragraph 1. Mr. Crick joined Perenco in 1986 and was responsible for all of the geoscience aspects of the company's growth until 1995. From 1995 to 2003, Mr. Crick was the technical manager responsible for the geoscience aspects of the company's development activity. In 2003, he created and headed a long-term planning group. He has been in his present position since 2008. (See also Crick WS II, paragraph 4).

7 Request for Arbitration dated 30 April 2008, paragraph 42; Amended Request for Arbitration dated 28 July 2008, paragraph 42.

8 Request for Arbitration, paragraph 43; Amended Request for Arbitration, paragraph 43. Claimant's Application for Provisional Measures dated 19 February 2009.

59. Due to various events, the nature of the relief sought changed over time. Ultimately, when it came to the quantum phase, Perenco no longer sought reinstatement of its rights under the Participation Contracts, which had been terminated in July 2010, but instead sought damages "in an amount that would wipe out all the consequences of Respondent's illegal acts and re-establish the situation which would have existed if those acts had not been committed, valued as of the date of the award, in the amount of US$1.6984 billion, subject to updating closer to the date of the award."[9] This amount was then adjusted to US$1.572 billion.[10]

60. This figure of US$1.572 billion was further adjusted downwards to US$1.423 billion as of 18 April 2016. During closing arguments at the Quantum Closing, counsel for the Claimant stated that:

> "…with current oil prices, Perenco, in an extension scenario, we have to confess, likely would not have pursued the Coca and Payamino waterfloods. … in the but-for world, Perenco would be developing these waterfloods as we speak at this time, and in today's world of relatively low oil prices, those wells would likely not be economic. Perenco, therefore, has to be true to the ex post principles that it has espoused, and we feel it's a matter of integrity, and, therefore, we would leave those projects to the side or suggest that you do in valuing damages in an extension case."[11]

61. Perenco also requests that post-award interest be at commercial, annually compounding rates, that Ecuador pay all legal and related costs, and all amounts paid by Ecuador pursuant to the Award be net of any Ecuadorian tax or other fiscal obligations. Finally, Perenco also seeks dismissal of Ecuador's counterclaims.

62. As the damages phase progressed, Professor Kalt helpfully set out his view of the principal points that divided the Parties. As shown in the table extract from his fourth expert report:[12]

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9 Cl. Mem. Q., paragraph 182(b).

10 Cl. Rep. Q., paragraph 278 (b).

11 Tr. Q. (6) 1641:17-20, 1642:6-14 (Claimant's Closing Argument).

12 Kalt ER IV, Exhibit JK-64.

Revised Kalt Damages	**$1,572.4**
Key Brattle Assumptions	***Standalone Effect on Damages ($Millions)***
Ex Ante Valuation	-$874.9
RPS Production Levels	-$910.0
No Stabilization of Law 42 at 50%	-$724.4
No Block 7 Extension	-$626.0
Remaining Effect of Other Assumptions	-$44.5[13]

2. The Respondent's Position

63. The Respondent has requested the following different forms of relief, depending upon the Tribunal's findings on key issues. In sum and primarily, it requests that no compensation be awarded to Perenco in order to account for the unpaid amounts of Law 42 dues that Perenco owes Ecuador.[14] However, should the Tribunal be inclined to award any compensation at all, such compensation should be calculated in accordance with Ecuador's submissions.[15]

64. In response to Professor Kalt, the Respondent's experts, Professor James Dow and Mr. Richard Caldwell of The Brattle Group ("**Brattle**"), presented a "waterfall chart" (the "**Waterfall Chart**") depicting the effects on quantum of certain decisions which Ecuador contended the Tribunal should take in relation to various aspects of the claim as presented by Perenco. The Respondent's initial version of the Waterfall Chart (dated 15 September 2015) was later updated to reflect the situation as of 18 April 2016.[16]

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13 Other elements of the DCF analysis on which Brattle and Professor Kalt disagreed include the treatment of future oil prices, operating costs, capital costs, the tax treatment of tariffs on the OCP pipeline, and pre-award interest. See Kalt ER IV, paragraph 101ff.

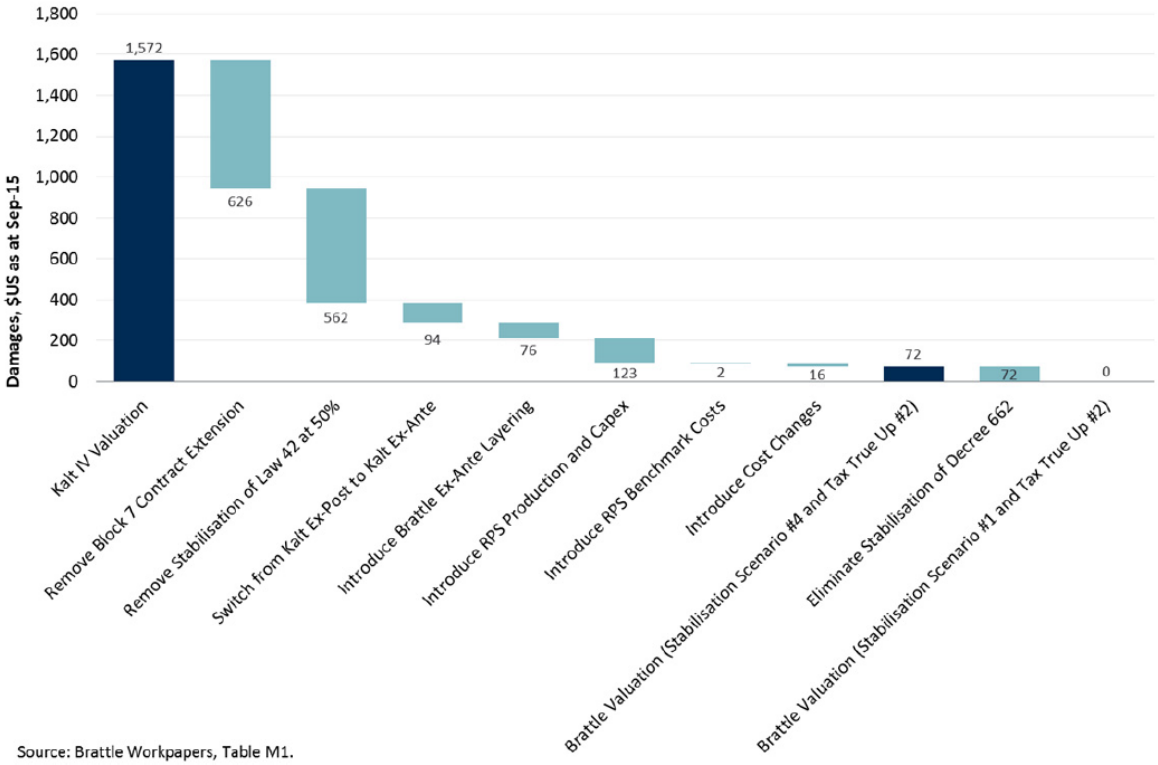
14 Resp. PHB Q., paragraph 183. Ecuador had earlier sought during the Liability Phase declarations that the enactment of Law 42 and implementing decrees and the institution of *coactiva* procedures did not breach the Participation Contracts or the Treaty.

15 Resp. PHB Q., paragraph 184. Ecuador asserts that the Quantum Hearing showed that Perenco's real claim amounted to a maximum of $343 million (Resp. PHB Q., paragraph 1).

16 Respondent's Closing Presentation Q., Slide 101.

65. Were the Tribunal to accept each of Ecuador's criticisms of Perenco's case on damages, the amount estimated by Professor Kalt would be reduced significantly:

Figure 16: Damages Waterfall



Source: Brattle Workpapers, Table M1.

B. The Main Issues that Separated the Parties

66. At the Quantum Hearing and at the Quantum Closing, it became clear that the main issues that separated the Parties in relation to the estimation of damages are relatively few.

67. The Respondent's Waterfall Chart (above) identified five main issues that divided the Parties:

1. The general approach to the valuation of damages: *i.e.*, whether damages are to be assessed *ex ante* or *ex post*, and whether on a 'layering' basis;
2. Whether in the 'but for' world, there would have been an extension of the Block 7 Contract (which was due to expire in August 2010), and if so, the nature of such an extension and its terms;

3. Whether, in estimating the damages for expropriation, the Tribunal should accept Mr. Crick's 'but for' drilling programme for both Blocks 7 and Block 21 or RPS' more modest drilling programme;

4. Whether all, or just a portion, of the effects of Law 42 at 99% should be assumed away in the 'but for' analysis; and

5. Whether a 'true-up' in favour of Ecuador should be applied, the effect of which would be to adjust the damages owed to Perenco.

68. By the time of the closing day's submissions, counsel for Perenco had narrowed the list to four issues: (i) *restitution*, "under which Perenco's damages should be calculated at Award date rather than breach date"; (ii) *production*, "whereby the number of wells Perenco would have drilled and the volumes of oil they would have produced should be based on Mr. Crick's forecast and not those of RPS"; (iii) *absorption*, "pursuant to which Perenco's contractual right to absorption of all Law 42 amounts should be valued rather than ignored"; and (iv) *extension*, "by which Perenco should be accorded value for the extension of the Block 7 Contract to which it was entitled and that it and Ecuador both wanted and would have agreed absent Ecuador's breaches."[17]

C. The Tribunal's Starting Point

69. The Tribunal begins by recalling that it is well understood in the jurisprudence on damages generally, that the assessment of damages whether in contract, tort or under a treaty, is "not an exact science."[18] Nor is it an exercise in economic theory to which the Tribunal was much subjected by the Parties in this case. The Tribunal did not find the extensive reference to economic theory developed principally in the analysis of U.S. judicial decisions to be helpful to it when estimating a reasonable figure to compensate Perenco for the damage which it has suffered as a result of Ecuador's breaches. The Tribunal found the debate over

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17 Tr. Q. (6) 1623:15-1624:8.

18 EL-281, *Joseph C. Lemire v. Ukraine*, ICSID Case No. ARB/06/18, Award, 28 March 2011, paragraph 248: "While the existence of damage is certain, calculating the precise amount of the compensation is fraught with much more difficulty, inherent in the very nature of the 'but for' hypothesis. Valuation is not an exact science. The Tribunal has no crystal ball and cannot claim to know what would have happened under a hypothesis of no breach; the best any tribunal can do is to make an informed and conscientious evaluation, taking into account all the relevant circumstances of the case, not unlike that made by anyone who assesses the value of a business on the basis of its likely future earnings."

"opportunistic" and "efficient" breach, however interesting to economists, legal theorists and judges in the United States, to be of no real value to the Tribunal and irrelevant to its task of deciding the quantum of damages to which Perenco was entitled.[19] That said, the Tribunal has profited from the experts' highly professional work on the key issues that the Tribunal has ultimately had to decide in arriving at this Award.

70. The Tribunal will begin by setting out in general terms how it intends to deal with the principal issues identified by the Parties. In view of the various determinations made in this Award and the adjustments that had to be made to the financial models employed by the experts to incorporate such changes, the Tribunal considers it to be unnecessary to recite all of the arguments advanced by the Parties.

71. Certain issues are addressed at the outset. These concern: (i) the date(s) of valuation of damages; (ii) the Tribunal's decision to employ two valuation dates; and (iii) the use of contemporaneous evidence. Having addressed these issues, the Tribunal will then summarise its general approach to the balance of the issues relating to the quantification of damages.

1. The Date of Valuation

72. Perhaps the most significant issue that divided the Parties concerned the date(s) of valuation. Perenco and its expert (on instructions) chose a single date, namely, the date of the expropriation on 10 July 2010. Contending that the expropriation was unlawful and having regard to the restitutionary relief that it initially had sought, Perenco argued that it should be entitled to the higher of the value of Perenco's interests in the two Blocks: as of the date of the declaration of *caducidad* or as of the date of the Award.[20] In this regard,

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[19] While the Claimant has contended that the Participation Contracts are governed by Ecuadorian law, it has also asserted that Ecuadorian law on damages articulates essentially the same standard of, and approach to, reparation as the international law standard expressed in the *Chorzów Factory* case (Cl. Mem. Q., paragraph 17; Cl. PHB Q., paragraph 2). In contrast, the Respondent has proceeded on the basis of international law while disagreeing that Ecuadorian law articulates the same standard of full reparation as international law (Resp. C-Mem. Q., paragraphs 17, 28-29). Given the Parties' focus on the international law issues arising in the quantum phase, the Tribunal has likewise focused on those issues.

[20] Cl. Mem. Q., paragraphs 11 & 22; Cl. Rep. Q., paragraphs 34-35 and 46-47. Perenco relies on the approach taken by the Permanent Court of International Justice in the case of the *Factory at Chorzòw* which

Perenco's expert, Professor Kalt, described what he saw as the inter-related nature of the various breaches found by the Tribunal; this led him to aggregate the breaches and to treat them as culminating in the formal taking of Perenco's interests in the Participation Contracts effected by the declaration of *caducidad*.

73. The valuation issue was bound up in the Parties' debate over so-called 'layering'. While Perenco argued for a single date (based on the expropriation), for its part, Ecuador and its experts (on instructions) asserted that Perenco and Professor Kalt had wrongly grouped together various independent breaches occurring over approximately two and a half years as if the Tribunal had found a creeping expropriation; this despite the Tribunal's having explicitly rejected Perenco's claim on that point and having held that the *coactivas* and Ecuador's taking over the operatorship of the Blocks after Perenco had suspended operations could not be counted towards a finding of indirect or creeping expropriation.[21] As counsel for Ecuador put it in closing argument:

> "…to be clear, Decree 662 was not enacted, as Perenco suggests implicitly in its arguments, with the intention of expropriating at some later point [,] here in 2010, Perenco's investments. This is not a case of creeping expropriation. What you need to do is calculate from October 2007 onwards and then, to avoid double-counting, calculate from July 2010 onwards without double-computing the impact of Decree 662."[22]

74. In accordance with Article 36(1) of the ILC Articles on the Responsibility of States for Internationally Wrongful Acts (the "**ILC Articles**"), the Tribunal considers that it should award compensation insofar as such damage is not made good by restitution, which compensation should cover "financially assessable damages including loss of profits insofar as it is established." The Tribunal recalls that it is well-established that the burden of proving damages lies with the claiming party.[23] In the absence of a creeping or indirect

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contemplated a different calculation of the damages for an unlawful expropriation than that which would be made in relation to a lawful one. See also Tr. Q. (6)1625 *et seq.* (Claimant's Closing Argument).

21 Resp. C-Mem. Q., paragraphs 4, 34-35, 207; Resp. Rej. Q., paragraph 132.

22 Tr. Q. (6) 1828:10-18.

23 EL-265, *S.D. Myers, Inc. v. Canada*, UNCITRAL, Second Partial Award, 21 October 2003, paragraph 173; CA-002-L, *Archer Daniels Midland Company and Tate & Lyle Ingredients Americas, Inc. v. United Mexican States*, ICSID Case No. ARB(AF)/04/5, Award, 21 November 2007, paragraph 285; CA-439, *Gemplus S.A.*,

expropriation effected by a series of discrete measures, the orthodox approach is for a claimant to identify the damages caused by each breach at the time of its occurrence.[24] It is moreover the case that the focus of the inquiry must be on damages *proximately* caused by the breaches found by the Tribunal.[25]

75. The Tribunal thus does not consider Brattle's efforts to value the impact of Decree 662, the first unlawful act, on Perenco's interests in the Blocks to be wrong in principle. Quite the contrary. The Tribunal agrees with Ecuador as to the suitability, in the circumstances of the present case, of valuing the breaches as and when they occurred, rather than focusing exclusively on the last completed breach. The Tribunal considers that counsel for Ecuador's characterisation of the facts, quoted above at paragraph 73, is correct. Even during the provisional measures phase of this proceeding, counsel for Ecuador confirmed that their client had no intention at that time to expropriate Perenco's interests in the Blocks. The Tribunal adverted to this intention not to expropriate in the Decision on Liability when discussing whether the Ministry should have stayed its hand in declaring *caducidad* during the pendency of these arbitral proceedings.[26]

76. As previously held by the Tribunal, Perenco failed to make out a creeping expropriation claim and its attempt now to employ in its stead what it called an "inter-linked course of

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SLP S.A., Gemplus, S.A., SLP, S.A. and Gemplus Industrial, S.A. de C.V. v. United Mexican States, ICSID Case No. ARB(AF)/04/3, Award, 10 June 2010, paragraphs 12-56 [hereinafter *Gemplus v. Mexico*].

24 CA-007-L *CME Czech Republic B.V. v. Czech Republic*, UNCITRAL, Partial Award, 13 September 2001, paragraphs 583-585; EL-265, *S.D. Myers, Inc. v. Canada*, UNCITRAL Second Partial Award, 21 October 2003, paragraph 140; CA-004-L, *BG Group Plc. v. Argentine Republic*, UNCITRAL, Final Award, 24 December 2007, paragraph 428; CA-003-L, *Azurix Corp v. Argentine Republic*, ICSID Case No. ARB/01/12, Award, 14 July 2006, paragraphs 417-18, 424; CA-012A-L, *Enron Corp. and Ponderosa Assets, L.P. v. Argentine Republic*, ICSID Case No. ARB/01/3, Award, 22 May 2007, paragraphs 389, 405, 420-23, 436.

25 CA-033-L, Draft Articles on Responsibility of States for Internationally Wrongful Acts, with commentaries 2001, Yearbook of the International Law Commission, 2001, vol. II, Part Two, U.N. Doc. A/CN.4/SER.A/2001/Add.1 (Part 2), p. 92, Art. 31, comment 10.

26 Decision on Liability, paragraph 709, quoting Ecuador's letter to the Tribunal: "Ecuador intends to carry out the enforcement of Law 42 in such a way as to avoid any disruption of Perenco's business. In particular, Ecuador does not intend to seize any assets of the Consortium beyond oil equivalent in value to the outstanding debt. Nor does Ecuador intend to terminate the relevant Participation Contracts, or take legal action against Perenco representatives." CE-212, Letter from Respondents regarding the Tribunal's Decision on Provisional Measures and Law 42, 15 May 2009.

conduct" is unavailing.[27] The breaches are of course inter-linked in that each is a part of the dispute as it evolved, but each has to be examined at its own time and in its own context. This is particularly the case when it is recalled that certain acts claimed to be in breach of contract or of the Treaty were not accepted as such by the Tribunal. For example, while the Tribunal accepted that Perenco could lawfully suspend operations under the *exceptio non adempleti contractus* doctrine, it also accepted that the State could in such circumstances lawfully intervene in the Blocks so as to safeguard their operating continuity and productivity after the Consortium suspended operations.[28] Similarly, the Tribunal held that the *coactiva* dispute, which arose when Perenco's decision not to pay Law 42 dues led Ecuador to seek to liquidate the claimed 2008 tax debt, resulted from the acts of both Parties. The Tribunal held that neither of these acts could be counted towards Perenco's theory of a creeping expropriation.[29]

77. The Tribunal recalls further that when analysing whether Perenco had made out its claim of a breach of the Treaty in relation to Law 42 at 50%, the Tribunal adverted to the conflation of different events occurring at different times.[30] The Tribunal has had the same sense in the quantum phase of the proceeding. It considers that Decree 662 and *caducidad*, separated as they were by a period of over two years, cannot be lumped together so as to land on a single date that is then used to value the breaches' collective impact.

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27 Tr. Q. (6) 1712:4. See the Decision on Liability, paragraph 710, rejecting the creeping expropriation argument advanced by Perenco.

28 Decision on Liability, paragraphs 705, 710.

29 *Ibid*., paragraph 703.

30 *Ibid*., paragraph 580: "In advancing its allegation of breach, the Claimant tended to conflate a series of measures which were taken at different times over a course of some four years. In its pleadings, the Claimant tended to lump together: (i) Law 42 at 50%; (ii) the promulgation and application of Decree 662; (iii) the Correa administration's demands for the migration of participation contracts to a service contract model; (iv) the subsequent demand for a faster migration to service contracts than that initially sought; (v) the demands for payment of levies claimed to have been owed under Law 42; (vi) the launching of *coactivas*; (vii) the decision to enforce the coactivas notwithstanding the Tribunal's recommendation that it not do so during the pendency of the arbitration; and (viii) the breakdown in negotiations which led to the Consortium's decision to suspend operations, which in turn led to the initiation of the proceeding resulting in the declaration of *caducidad*."

78. Not only did the Tribunal differentiate in its Decision on Liability between Decree 662, the first completed breach, and *caducidad*, the last completed breach, it also distinguished between Decree 662 and the other fair and equitable treatment breaches that followed before Perenco suspended operations. The Ministry declared *caducidad* a year later after requesting Perenco to return to the Blocks on four separate occasions, requests that Perenco refused to countenance unless Ecuador complied with the Tribunal's Decision on Provisional Measures. It was only after the Ministry gave these warnings and Perenco refused to resume operations that the Ministry made a declaration of *caducidad*.[31] To point this out is not to excuse the Ministry – the Tribunal has agreed with Perenco that the *caducidad* amounted to an expropriation under Article 6 of the Treaty – but rather to make the point that Perenco's decision to suspend operations compelled the government to intervene to protect the Blocks and their production, and the warnings that Perenco should resume operations or face a declaration of *caducidad* were based on one of the grounds for termination listed in Article 74 of the Hydrocarbons Law.[32]

79. Of specific relevance to the proposed single date of valuation based on the "inter-linked course of conduct" argument, the Tribunal notes that the fair and equitable treatment breaches themselves were not treated as all in one package in the Decision on Liability. In addition to rejecting the creeping expropriation contention, the Tribunal differentiated between the offending measures as follows:

> "606….Decree 662 marked the beginning of a series of other measures in breach of Article 4 taken in relation to the Participation Contracts, namely: (i) demanding that the contractors agree to surrender their rights under their participation contracts and migrate to what for a considerable period of time was an unspecified model, such that the contractors were unable to discern precisely what they were being asked to move to; (ii) escalating negotiating demands, in particular in April 2008 when the President unexpectedly suspended the negotiations and rejected what had recently been achieved in a Partial Agreement in respect of one of the blocks; (iii) making coercive and threatening statements, including threats of expulsion from Ecuador; and (iv) taking steps to enforce Law 42 against Perenco (and Burlington) for non-payment of dues claimed to be owing, a portion of which has been held to be in breach of Article 4, and when no

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31 *Ibid*., paragraph 707.

32 *Ibid.*, paragraph 706.

> payments were made, forcibly seizing and selling the oil produced in Blocks 7 and 21 in order to realise the claimed Law 42 debt. This set the stage for the Consortium's suspension of operations and ultimately the declaration of *caducidad* which formally terminated the Consortium's rights in the two blocks.
> 607. The Tribunal has already noted that Ecuador has not contested the Claimant's assertion that Decree 662 was intended to force a renegotiation of the participation contracts in order to migrate Petroecuador's counterparties to service contracts. In the Tribunal's view, moving beyond 50% to 99% with the application of Decree 662 amounted to a breach of Article 4 of the Treaty *and the measures, taken collectively, just listed also* constituted breaches of Article 4." [Double emphasis added.]

80. As the underlined and italicised passages indicate, the Tribunal distinguished between Decree 662 and the measures that followed. This is not to suggest that none of these were related to the others, but the Tribunal was alive to the fact that some of the breaches (and other alleged breaches which were not accepted as such) arose out of complex interactions between the Consortium and/or the individual acts of its members, Perenco and Burlington, and the State.[33]

81. The facts and the findings were thus somewhat more complicated than the way in which they have sometimes been treated in the course of the quantum pleadings. The Tribunal has accordingly found it necessary to revert to specific prior findings from time to time so as to provide context for certain findings made in this Award.

82. Quite apart from the issues of context and timing, the Tribunal considers that Decree 662 had the effect of converting the Participation Contracts into *de facto* service contracts (and, as Perenco pointed out during the quantum phase, imperfect ones at that, because they provided no protection against lower oil prices[34]), but the decree did not purport to interfere with the Contracts' operation below the reference price.[35] Perenco continued to both hold

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33 The first led to the *coactivas* aimed at collecting the claimed tax debt which the Tribunal has found to be a breach of contract (at paragraph 579 of the Decision on Liability, the Tribunal found that it was not necessary to consider the measures as a breach of treaty); the second was found to be a breach but one that Perenco was found to have contributed to; and the third, the State's intervention to operate the Blocks was found to be a lawful response to Perenco's suspension of operations. Decision on Liability, paragraphs 417, 697 and 708.

34 Cl. Rep. Q., paragraph 132.

35 As noted in an email report sent shortly after Perenco representatives met with the Minister of Mines: "If we drill the OSO23 we must explain to the state that this is the last one and that we do it because of contractual

and exercise those contractual rights up to the date of its decision to suspend operations (and thereafter, in that Ecuador credited Perenco's account with revenues derived from sales of crude oil while it operated the Blocks after the Consortium suspended operations and up to the declaration of *caducidad*).[36]

83. Thus, the Tribunal did not see a set of inter-linked measures so closely connected in time as to convince it to aggregate them and employ the single valuation date for which Perenco contended. Nor did it consider that the challenges of valuing the breaches individually was of such complexity as to require the damages estimation exercise to default to a single date of valuation.

84. Tribunals are not bound to accept a party's proposed date of valuation. In *Sempra*, for example, while the tribunal ultimately agreed with the claimant's proposed date, it observed:

> "209. The Tribunal will accordingly use December 31, 2001 as the proper valuation date. This is not because it believes that the Claimant's argument should be given any deference, but simply because the explanation given shows that there was an investment decision made in good faith. Neither does the Tribunal share the interpretation which the Claimant has given to *CMS* with regard to the payment of certain deference in the choice of a valuation date. It is apparent that in *CMS* no acts or decisions taken by the claimant after the injunction raised any doubt about the date which triggered the events complained of."[37]

85. Having regard to all of the circumstances and to its prior findings, the Tribunal therefore prefers the kind of 'layering' analysis proposed by Ecuador's experts, albeit with important modifications to Brattle's approach. The Tribunal intends to value the first completed

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obligation with the drilling contractor, and that it is obviously difficult to stop a campaign so quickly. In other words we don't want the state to believe that we carry on drilling because it is still profitable." [Emphasis added.] Exhibit BR-26, Email dated 9 October 2007. See *Murphy Exploration and Production Company v. Republic of Ecuador (II)*, PCA Case No. 2012 –16 (formerly AA 434), Partial Final Award, 6 May 2016, paragraphs 276 – 280 (hereinafter *Murphy v. Ecuador*), which is in accord with the approach taken by the Tribunal in its Decision on Liability.

36 E-398, Updated Table – Auctions Block 7; E-399, Updated Table-Auctions Block 21.

37 *Sempra Energy International v. Argentine Republic*, ICSID Case No. ARB/02/16, Award, 28 September 2007, paragraph 209. See also EL-290, *Anatolie Stati, Gabriel Stati, Ascom Group S.A. and Terra Raf Trans Trading Ltd v. Republic of Kazakhstan*, SCC Case No. V116/2010, Award, 19 December 2013, paragraphs 1493-1498.

breach and then adjust it in certain ways for reasons explained below. It will then turn to the subsequent breaches and do the same (if there is evidence of financially assessable damage proximately caused by each breach). It considers that this approach is consonant with international law and legal practice.

86. The Tribunal notes that bound up in the Parties' debate over 'layering' were arguments as to whether Brattle acted consistently with their declared intention to value the breaches separately on an *ex ante* basis. Perenco criticised Brattle for its having focused on the two breaches of Decree 662 and *caducidad* specified in the Decision on Liability's *dispositif* without estimating the economic effects of the intervening breaches (demanding that contracts migrate to services contracts, making escalating contractual demands, and making coercive and threatening statements).[38] Yet, the Tribunal would note that this criticism overlooks the point noted above at paragraph 74 that it is not incumbent upon a respondent to make a claimant's case on damages; that burden is the claimant's.[39] Indeed, a respondent is entitled to simply challenge the claimant's approach if it sees fit to do so without proffering an alternative estimation of the damages that might be payable. Perenco was put on notice of the 'layering' approach by the Respondent's first responsive pleading in the damages phase.[40] The fact that Brattle did not attempt to value escalating contract demands, for example, did not preclude Perenco from seeking to do so.[41] However, while

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38 Cl. Rep. Q., paragraphs 257-259.

39 *AIG Capital Partners, Inc. and CJSC Tema Real Estate Company v. Republic of Kazakhstan*, ICSID Case No. ARB/01/6, Award, 7 October 2003, paragraph 12.1.9: "The burden of establishing by reliable evidence the quantum of damages or compensation for the expropriation was and is on the Claimants." See also CA-439, *Gemplus v. Mexico*, Award, paragraphs 13-80: "It is for the Claimants, as claimants alleging an entitlement to such compensation, to establish the amount of that compensation: the *principle actori incumbit probatio* is '*the broad basic rule to the allocation of the burden of proof in international procedure*'."

40 Brattle ER II, paragraphs 43 and 254; Cl. Rep. Q., paragraphs 257-269 commenting thereon.

41 The Tribunal takes note of Brattle's Rebuttal Report (Brattle ER III), where it was stated at f 83: "Professor Kalt's approach to *ex-ante* assessment also is incorrect if we were to accept the alternative - that it were possible to quantify separate damages flowing from the separate breaches in paragraph 606. This view would prompt only the introduction of an additional layer in the damages analysis to reflect the separate FET breach (which we deem quantifiable) at the associated date of breach. Perhaps this would be the moment when 'taken collectively', the measures identified in paragraph 606 of the Liability Decision amounted to a separate breach of the FET standard. Because the Liability Decision did not identify any such date, in particular in the dispositive section, we have not undertaken such an analysis. The addition of a third layer is unlikely to have a material impact on the damages to Perenco. We stand ready to introduce a third layer in the analysis if requested by the Tribunal to do so."

it criticised Brattle's approach in its Quantum Reply, Perenco continued to base its damages case on a single valuation date, thus running the risk that the Tribunal might be persuaded by Brattle's approach and thus be presented with no attempt to value the breaches arising between Decree 662 and *caducidad*.

87. As for certain other criticisms of Brattle's 'layering' approach, such as Perenco's observation that Brattle's avowed *ex ante* approach to valuing the impact of Decree 662 on Perenco was not adhered to when Brattle used *ex post* information to make its 'true-up' argument, these are addressed below.

88. For its part, Ecuador maintained that the dispute between the Parties evolved over time. Therefore, it argued that its experts were right to estimate the effects of separate breaches occurring at different times in order to avoid double counting. Brattle estimated the impact of Decree 662 as of 4 October 2007, then estimated the impact of *caducidad* on the already diminished (but also already compensated) value of Perenco's interests in the Blocks.

89. Ecuador observed in this respect that Brattle's valuation as of the date of Decree 662 accorded with Perenco's contemporaneous calculations performed in October 2007, just days after Decree 662 was promulgated. With regard to Law 42 at 50%, Perenco calculated that the NPV for its interests in the two Blocks through to their date of expiry amounted to US$239.4 million[42]; Brattle's initial NPV calculation of the interests was US$265.7 million[43] but this was later adjusted upwards in its Reply Report to either US$282.2 million (using RPS' capital costs) or US$295.8 million (using Professor Kalt's costs). With regard to Decree 662, Perenco's contemporaneous NPV calculation for its interests in the two Blocks was US$154.6 million[44]; Brattle's initial values were US$107.7 million[45] and this was later updated by Brattle to come to US$127.6 million (using RPS's costs) or US$127.5 million (using Professor Kalt's costs).

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42 US$122 million for Block 7 and $117 million for Block 21. Brattle ER II at fn. 157.

43 US$111 million for Block 7 and $171 million for Block 21. Brattle ER II at fn. 157.

44 US$84 million for Block 7 and $71 million for Block 21. Brattle Table M.

45 US$60 million for Block 7 and $68 million for Block 21. Brattle Table M.

90. In disputing Ecuador's attempt to use an earlier date in assessing damages, Perenco argued that 'layering' was conceptually flawed in this case because Ecuador's breaches were inter-related. Such inter-related breaches led to layering being rejected in *SAUR*.[46] Here, each of Ecuador's breaches was inextricably linked to the others (and it was irrelevant, in Perenco's view, that the Tribunal did not find a creeping expropriation).[47] The principle of full reparation warranted the use of a single valuation date in order to capture the cumulative effect of the breaches and thereby grant Perenco proper restitution. Brattle's approach was inconsistent with the principle that a breaching State could not be given credit for actions that depressed the value of the investment prior to expropriation (as recognised in *Occidental II*).[48]

91. Perenco argued further that Brattle admitted that they applied 'layering' in a way that reduced Perenco's damages at every turn. Professor Dow conceded that if 'layering' were done in a different order, Perenco's damages would be higher.[49] Perenco contended that Professor Dow and Mr. Caldwell also admitted on cross-examination that they had essentially transferred only the "good" risk and imposed on Perenco the "bad" risk: they had ignored actual high oil prices after Decree 662 in estimating Perenco's anticipated revenues, but reduced Perenco's damages by offsetting the actual Decree 662 payments based on those higher oil prices, and then deprived Perenco of the *coactiva*-seized oil's actual market price.[50] Brattle's approach also presumed that in setting an *ex ante* price, a willing buyer would have foreseen the whole sequence of later events —including, ultimately, oil seizure— yet Mr. Caldwell admitted that "nobody standing in October '07 would have predicted all the set of the chain of events that would actually occur."[51]

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46 Cl. Rep. Q., paragraph 264.

47 *Ibid.*, paragraph 265.

48 Cl. PHB Q., paragraph 20.

49 *Ibid.*, paragraph 21.

50 Tr. Q. (5) 1538:9-14 (Dow); Tr. Q. (5) 1556:19-1559:2 (Caldwell); see also Brattle Workpapers, Table P.

51 Tr. Q. (5) 1552:11-13, 1557:18-21 (Caldwell); see also Brattle ER II, paragraph 53; *cf.* Tr. Q. (5) 1552:11-13 (Caldwell).

92. Perenco added that Brattle's various '*stabilisation*' scenarios made no sense. Professor Dow and Mr. Caldwell admitted that their lump-sum '*side payment*' for Decree 662 amounted to continuing to apply Decree 662 to Perenco, even though the purpose of damages was to wipe out the effects of Decree 662.[52] It could not be assumed that Perenco would have ceded all of its future upside for a single payment in October 2007. In addition, the notion that Perenco's expectations were immutable as of October 2007 was inconsistent with the fact that Perenco continued to operate in Ecuador after Decree 662.

93. Moreover, Brattle had not explained why any '*hypothetical tax threshold*' between 50% and 99% was at all appropriate when the Tribunal's task was to eliminate Decree 662 in its entirety. Brattle's '*stabilisation*' scenarios were built on variations of what Ecuador contended were the parties' assumed pre-contractual expectations of the economy of the Contracts, but Mr. Caldwell could not even articulate the rationale for using such expectations to determine the damages to which Perenco was entitled under the Treaty.[53]

94. Ecuador responded to Perenco's contentions as follows.

95. First, at the Quantum Hearing, Ecuador presented the Waterfall Chart showing the different components of damages claimed by Perenco and illustrating the impact of correcting each component.[54] Perenco did not challenge the figures in the Waterfall Chart.[55]

96. Second, in response to Perenco's criticism that 'layering' was invalid because of the inter-related nature of Ecuador's breaches, Perenco did not explain why the breaches were inter-related and why interrelation would matter at all to 'layering'.[56] Professor Kalt acknowledged for the first time at the Quantum Hearing that he himself had done a monthly layering in his *ex ante* analysis, which stood in contradiction to his and Perenco's criticism

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52 Tr. Q. (5) 1526:4- 1527:15 (Dow); *ibid.* 1592:17-1593:1, 1593:17-1594:4 (Caldwell); *cf.* id.1259:11-17, 1265:5-1278:1 (Kalt).

53 Tr. Q. (5) 1590:8-1591:7 (Caldwell) (stating it was a matter of instruction).

54 Brattle ER III, Figure 16.

55 Resp. PHB Q., paragraph 138.

56 Resp. Rep. PHB Q., paragraph 101(i).

on 'layering'.[57] Professor Kalt's '*mark-to-market*' contingent contract justification for his *ex ante* calculation was entirely new at the Quantum Hearing and entirely different from the logic advanced in his Fourth Expert Report.[58]

97. In respect of Perenco's criticism that neither Ecuador nor Brattle addressed the fact that the Tribunal found other breaches apart from Decree 662 and *caducidad*, Ecuador asserted that Brattle's 16 October 2015 Expert Report (at paragraphs 88 to 90) addressed this at length and it was Perenco who chose not to cross-examine Brattle's experts on this point during the Quantum Hearing.[59]

98. In respect of *SAUR*'s rejection of 'layering', Ecuador explained that that tribunal rejected 'layering' because in that case the first-in-time breach had already deprived the investment of all value, which was not the case here.[60] In *Occidental II*, the two breaches found by that tribunal were only weeks apart and hence the issue was not even discussed.[61] In contrast, in the present case the two principal breaches occurred in 2007 and 2010.

99. Finally, in respect of Perenco's claim that Brattle had admitted that they applied 'layering' in a way that reduced Perenco's damages at every turn, Ecuador argued that this illustrated Perenco's confusion of rather simple economics. Perenco's sole criticism was directed at Brattle's calculation of the 'true-up', which was *ex post* (*i.e.*, considering actual prices) while calculating damages to Perenco *ex ante*. As Brattle explained, "the true up adopts an *ex-post* perspective inherently, since it must look back and assess what Law 42 amounts were actually paid by the Consortium and which levies remain outstanding."[62] There was nothing unsound in this calculation and Professor Kalt never took issue with it. Brattle further explained that imposing on Perenco the change in oil prices when it chose to

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57 Tr. Q. (5) 1478:12-1479:13 (Kalt).

58 Resp. Rep. PHB Q., paragraph 101(i) *c.f.* Cl. PHB Q., paragraph 18 and Kalt ER IV, paragraphs 47-52.

59 Resp. Rep. PHB Q., paragraph 101(ii).

60 *Ibid.*, paragraph 101(iii).

61 *Ibid.*, paragraph 101(iv).

62 Brattle ER II (4 May 2015; errata 2 June 2015), paragraph 53.

withhold taxes was appropriate, while also acknowledging that the allocation of risks was ultimately an issue for the Tribunal (hence the sensitivity calculations of the 'true-up').

100. As noted above in paragraph 77, the Tribunal has decided that it is appropriate to seek to value the damages caused by different breaches occurring at different times. To the extent that the Tribunal accepts that there were any deficiencies in the way in which Brattle performed the exercise, these can be remedied in the damages calculation.

101. Having concluded thus, the Tribunal would also note at this point that Perenco had also contended, in tandem with its single valuation date approach, that an *ex post* approach should be taken where there is an unlawful expropriation and the value of the investment had increased.[63] Ecuador disagreed. In light of the Tribunal's analysis above, and its layering / "clean sheet" approach (discussed below), the Tribunal does not consider it necessary to delve into the arguments on this point.

2. Has Perenco demonstrated any loss or damage proximately caused by the post-Decree 662 fair and equitable treatment breaches?

102. As noted in paragraphs 74 and 85 above, the Tribunal will award damages for any quantifiable financial losses proximately caused by the breaches determined by it in the merits phase. Damages will be awarded for Decree 662 and the declaration of *caducidad*. This raises the question whether the other breaches of fair and equitable treatment suffered by Perenco after Decree 662 but before the expropriation have been shown to result in cognisable harm.

103. To reiterate, these breaches are: "(i) demanding that the contractors agree to surrender their rights under their participation contracts and migrate to what for a considerable period of

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63 See Cl. PHB Q., paragraph 7, citing CA-1, *ADC Affiliate Limited v. Hungary*, ICSID Case No. ARB/03/16, Award of the Tribunal, 27 September 2006, paragraphs 496-497; CA-438, *Ioannis Kardassopoulos v. Georgia*, ICSID Case Nos. ARB/05/18 and ARB/07/15, Award, 3 March 2010, paragraph 514, CA-444. *ConocoPhillips Petrozuata B.V., ConocoPhillips Hamaca B.V. and ConocoPhillips Gulf of Paria B.V.* v. *Bolivarian Republic of Venezuela*, ICSID Case No. ARB/07/30, Decision on Jurisdiction and Merits, 3 September 2013, paragraph 343; CA-447, *Yukos Universal Limited v. The Russian Federation*, PCA Case No. AA 227, Final Award, 18 July 2014, paragraph 1767; EL-327, *Quiborax S.A. and Non-Metallic Minerals S.A. v. Plurinational State of Bolivia*, ICSID Case No. ARB/06/2, Award, 16 September 2015, paragraphs 370 *et seq.*

time was an unspecified model, such that the contractors were unable to discern precisely what they were being asked to move to; (ii) escalating negotiating demands, in particular in April 2008 when the President unexpectedly suspended the negotiations and rejected what had recently been achieved in a Partial Agreement in respect of one of the blocks; (iii) making coercive and threatening statements, including threats of expulsion from Ecuador; and (iv) taking steps to enforce Law 42 against Perenco (and Burlington) for non-payment of dues claimed to be owing, a portion of which has been held to be in breach of Article 4, and when no payments were made, forcibly seizing and selling the oil produced in Blocks 7 and 21 in order to realise the claimed Law 42 debt."[64]

104. However, with the exception of the sales of oil seized and sold pursuant to the *coactivas*, which must be adjusted in the 'true-up' exercise to be consistent with the Tribunal's finding on Decree 662, it appears that neither Party's experts undertook the exercise of quantifying damages attributable to those breaches during the pleadings phase. Therefore, it might be that these are breaches for which proximate damage has not been estimated and therefore no damages can be awarded.[65] This is the position taken by Brattle.[66]

105. The Tribunal understands that Professor Kalt's view was that breaches (i) and (iii) listed above "would be expected to adversely affect Perenco's investment and production decisions."[67] The Tribunal agrees, but it also considers that this already occurred when Decree 662 took effect and Perenco stopped drilling in both Blocks (except for Oso 23). Since the Tribunal has found that wells would have been drilled in both Blocks after Decree 662 and Perenco will be compensated for the cash flows associated with those 'but for' wells as well as for the loss of the opportunity to negotiate the extension of Block 7 (see Sections II.D.3 and II.F below), in the Tribunal's view, Professor Kalt's concerns on these particular points are met.

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64 Decision on Liability, paragraph 606.

65 Perenco criticised Brattle's layering approach for estimating the impact of Decree 662 and *caducidad* only. The Tribunal's understanding is that Professor Kalt also criticised layering but did not offer any quantification of the damages for these breaches if and when they occurred.

66 Brattle ER III, paragraph 90

67 Kalt ER IV, paragraph 49.

106. As for the *coactivas* issue, the Tribunal will reflect in the Award a sum of damages flowing from Perenco's being credited for the depressed auction price received for the seized oil rather than the market value. The Parties spent considerable time over the course of this proceeding addressing the impact of the *coactivas*. There is record evidence on the amounts of oil seized, the prices at which it was sold and the amounts that were credited to Perenco. However, the analysis is complicated by the fact that after submitting its claim to arbitration, Perenco (and Burlington) stopped paying Law 42 dues and instead began to deposit them in an account located outside of Ecuador. Given that Perenco failed in its attempt to prove a breach of contract and Treaty for Law 42 at 50%, the Tribunal considers that there is some merit to Ecuador's 'true-up' claim. It follows that some accounting for Perenco's non-compliance with Law 42 must be performed. In the Tribunal's view, this issue is best addressed as part of its discussion of Ecuador's 'true-up' claim below.

107. In sum, the Tribunal considers that the financial impact of the non-Decree 662 breaches has either been accounted for in the 'but for' analysis of Decree 662 as of 4 October 2007 or was not quantified by the expert reports submitted with the Claimant's pleadings on quantum.

3. Use of a 'clean sheet' for the valuation of the expropriation damages

108. The Tribunal has accepted Ecuador's submission that the use of a single date for valuing the damages is not appropriate in the circumstances of this case. The Tribunal recalls that Brattle defended its 'layering' approach based on the need to safeguard against double-counting:

> "We then estimated the FMV of Perenco's interests in July 2010, when Ecuador declared Caducidad. The Tribunal deemed Caducidad to amount to expropriation. Our estimate of the July 2010 FMV of Perenco's interests netted off the impact of Decree 662, reflecting our separate quantification of the damages due in relation to it in the first step. Netting off the impact of Decree 662 was necessary to avoid double-counting."[68]

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[68] Brattle ER III, paragraph 67(b).

109. The Tribunal agrees that double-counting must be avoided, but it has arrived at a different solution from that proposed by Brattle.

110. This results from the Tribunal's seeing merit in Perenco's concern that estimating the damages as of the first completed breach could be unfair to it. Depending upon how the compensation for the first completed breach is calculated, it is possible, as Professor Kalt contended, that factoring in the effects of Decree 662 could have a price-depressing impact on Perenco's rights that ended up being expropriated.

111. Having carefully reflected on the Parties' submissions, the Tribunal has concluded that the fairest approach to take in the circumstances of the present case is the following: Since at the time of the first breach it was by no means certain that an expropriation would follow Decree 662 some 33 months later, the Tribunal will calculate the damages proximately caused by Decree 662 for the period 4 October 2007 to 20 July 2010. This is on the basis that Decree 662 was the only compensable breach for that period of time.

112. In principle, the Tribunal would have also awarded any damages proximately caused by the subsequent fair and equitable treatment breaches, but it has already found that the Claimant did not adduce evidence of the financial impact of the post-Decree 662 fair and equitable treatment breaches. Therefore, no damages can be awarded for those breaches. But since Perenco's rights were brought to an end by the act of *caducidad*, the Tribunal will re-estimate the loss of those rights according to then-prevailing market conditions and industry expectations (as well as in light of the hypothetical increased production in the two Blocks in the 'but for' scenario).

113. Having arrived at this approach, the Tribunal's initial thinking was that this would be done based on the ratio between the total number of months between October 2007 and July 2010 and the total number of months from October 2010 until contract expiry. However, a simple temporal pro-rating would lead to a biased result that could assign a lower value to cash flows that would have been generated during the October 2007 to July 2010 period

than should be the case.[69] In the circumstances, therefore, the Tribunal has added up the discounted cash flows in the October 2007 damages model through to July 2010. This ensures that the value for the October 2007 layer of damages reflects the actual discounting and contribution of pre-July 2010 cash flows to the October 2007 fair market value and also accounts for the full cost of any pre-July 2010 CAPEX.

114. The result is an initial award of damages for Decree 662's impact during the roughly 33-month period between the first completed breach and the last breach. Then, because of the effect of the expropriation, a new valuation is performed, based on pricing and market information available as of the date of the expropriation. The initial award of damages attributable to Decree 662 is capped at that point; this then requires the Tribunal to make certain determinations as to the nature of the contractual rights that were terminated. These are included in the calculation and the value of the one-month interest in Block 7 as well as the approximately 10-year period left on Block 21 will be estimated.

115. The Tribunal has taken this approach because it accepts Professor Kalt's concern about valuing an asset whose value had already been diminished. Thus, rather than valuing what might be called the 'below reference price' contractual rights, in theory compensated by the prior award of damages, as of the day before the expropriation, the Tribunal will establish a new valuation of the totality of the contractual rights that were taken away from Perenco, based on the prevailing market conditions. This analysis will be *ex ante*, but it will allow the Tribunal to consider all relevant actual market developments as well as employ the assumptions as to what Perenco would have done in both Blocks during the prior period and what it would have done in the remainder of the Blocks' lives.

116. Unlike the situation in *ADC v. Hungary*, where the value of the airport concession rights at issue had crystallised after the submission of the claim to arbitration and before the date of

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69 This is due to the fact that a pro-rating approach would implicitly assume that the value produced by the field was constant in each month over the field's life. Discounting would over-weight cash flows that are nearer in time relative to those further off in the future. In addition, value is often front-end loaded because production rates often start high and then decline over time. Declining profiles result in higher revenue and cash flows earlier in field life than later. Pro-rating would also cause problems with the modeling of capital expenditures.

the award[70], the Tribunal finds itself in the midst of a period stretching between *caducidad* and the date of expiry. Having regard to the Parties' extensive debate over the use of *ex ante* versus *ex post* valuation data, the Tribunal is concerned about the degree of randomness associated with employing the date of the Award as the valuation date since a single significant event can have dramatic effects on valuation given the volatility of the oil market. In the circumstances of this case, the Tribunal will employ an *ex ante* willing buyer-willing seller approach using the price of oil prevailing at the time of the expropriation (approximately US$76/bbl WTI as of July 2010).

117. In line with its conclusions that:

(i) there were no inter-linked breaches such as to justify the use of a single date of valuation;[71]

(ii) it is in principle appropriate to seek to value the damages caused by the different breaches occurring at the relevant times; and

(iii) the contemporaneous evidence of value is a useful check against the Tribunal's estimates;

the Tribunal considers that an approach using the well-accepted *ex ante* approach to valuation as the primary point of reference is reasonable and appropriate in the circumstances. (It uses the word "*primary*" because of the fact that with the passage of time between the commencement of this arbitration and the rendering of this Award, Petroamazonas has operated the Blocks and inevitably the testimonial and expert evidence pertaining to the operation of Block 21, in particular, has mixed *ex ante* with *ex post* data. In the circumstances, the Tribunal has no interest in attempting to 'unscramble the egg' by drawing a strict line between these data.)

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70 *ADC Affiliate Limited and ADC & ADMC Management Limited v. Republic of Hungary*, ICSID Case No. ARB/03/16, Award, 2 October 2006.

71 See above, Section II.C.1) Date of Valuation.

4. The Role of Contemporaneous Evidence of Value

118. The Tribunal is strengthened in its belief that estimating the damages attributable to each breach and in chronological order is the correct approach to be taken in the circumstances of this case, by the availability of Perenco's contemporaneous net present value (NPV) calculations of the impact of Law 42 at both 50% and 99% on both Blocks. These calculations were performed immediately after Decree 662's announcement.[72] The spreadsheet for Block 21, for example, which was disclosed by Perenco in the documents production phase and reviewed by Brattle, shows that the NPV calculation for Block 21 ran, as would be expected, to Block 21 Contract's expiry date of 2021.[73]

119. These documents of the Claimant's own making are, in the Tribunal's view, good evidence of the Blocks' estimated value with Law 42 at 50% and 99% in light of the existing and expected market circumstances at the time of the first breach. Brattle studied Perenco's calculations and adjusted them; Perenco had, for example, used July 2007 WTI prices rather than the higher prices prevailing in early October 2007. In fact, Brattle ended up arriving at somewhat higher NPV calculations than Perenco itself did at the time.[74]

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72 Exhibit BR-26.

73 Exhibit BR-27 (NPV impact of Law 42 at 99%); Exhibit BR-28 (NPV impact of Law 42 at 50%).

74 See Brattle ER II, paragraph 253: "Damages for this economy of the contract scenario resemble the financial analysis performed by Perenco, in October 2007 immediately after the introduction of Decree 662. We estimate that Decree 662 reduced the October 2007 fair market value of Perenco's Block 7 and 21 interests by $158 million (excl. prejudgment interest), just less than double the $85 million estimated by Perenco at the time." This is further elaborated in footnote 157 to the same paragraph: "Perenco's estimate of $84.8 million appears in an 9 October 2007 email from Jerome Garcia. With Law 42 at 50%, we estimate the October 2007 fair market value at $109.1 million for Block 7 and $156.6 million for Block 21. This compares with the $122.1 million for Block 7 and $117.3 million for Block 21 reported in the Jerome Garcia email. At Block 21 (where we have the Perenco models), we assume higher prices and costs than Perenco's models (PERPROD0032725 (Exhibit BR-27) and PERPROD0032726 (Exhibit BR-28)), and more production. With Decree 662, we estimate the October 2007 fair market value at $58.8 million for Block 7 and $48.9 million at Block 21. This compares to the $84.1 million for Block 7 and the $70.5 million for Block 21 estimated by Perenco at the time. Given the presence of Decree 662, our fair market value estimate for Block 21 is lower than Perenco's because our model assumes higher operating costs."

120. In its Reply Post-Hearing Brief, Perenco downplayed the significance of its NPV calculations, describing them as "*back-of-the-envelope, hurried calculations to understand Decree 662's immediate impact.*"[75]

121. Ecuador had addressed this contention in its closing submissions at the Quantum Closing. Slides 122 and 123 of Ecuador's presentation showed that the calculations were closely comparable to Perenco's other valuations, made prior to Decree 662's coming into effect, as to the Blocks' value and indeed in one case what Perenco –*acting as a possible willing purchaser*– might be willing to pay Burlington for the latter's interests in the Blocks just one month before Decree 662's promulgation.[76] In counsel's submission:

> "This confirms that the allegedly hurried calculation of BR-26 is not such hurried valuation. It actually follows from a September 2007 valuation, that's consistent, and then it's much higher than the March 2007 valuation. These were prepared with plenty of time, not in a hurry. And as you can see at the bottom of the table, we have put Brattle's valuation. Brattle's valuation of Block 7, 111.3 million, is within 10 percent of Perenco's own valuations in October and September 2007 and higher than their earlier valuation of March 2007.
> The same happens with Block 21."[77]

122. The Tribunal considers that Perenco's analysts would have had a good preliminary understanding of Decree 662's impact on the company's interests in the Blocks. The email chain's distribution list contains the names of seven Perenco employees who were involved in analysing Decree 662, including Eric d'Argentré, Perenco's Country Manager for Ecuador. Obviously, the calculations were based on the information available to the company at the time. This necessarily has to be the case when projecting into the future with a new factor added into the mix. But the projections were being made by employees with knowledge of (i) the Participation Contracts' terms; (ii) the Blocks' performance to

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75 Cl. Rep. PHB Q., paragraph 73.

76 Tr. Q. (2) 366:18–367:5 (Cross-examination of Combe): "This is a valuation document for purchase. So, I would expect a —and I have to say, I did not participate in it— so, that's my opinion might be slightly different from what Paddy [Spink] did here —Paddy was our manager for new business— but basically he was being conservative in evaluating prices so he would assume probably the low case. So, if Conoco was not putting any value on the extension, then he wouldn't offer any additional value. That's standard practice, basically."

77 Tr. Q. (6) 1833:9-20 (Respondent's Closing Submission).

date and their characteristics and potential; (iii) Perenco's and the Consortium's intentions; and (iv) wider industry market expectations at the time.

123. During 2007, in the months leading up to Decree 662, Perenco: (i) produced its Mid-Term Outlook in March; (ii) valued Burlington's interests in the Blocks with a view to a potential purchase in September; and (iii) analysed the effect of Decree 662 in October 2007.[78] The Tribunal notes that Professor Kalt commented in his December 2014 expert report that in his experience, "*investors in oil and gas properties and contracts routinely use DCF analysis in the course of business to provide them with measures of how much they should value an investment and, in certain cases, how much they should be willing to pay, or be paid, for oil and gas development projects*."[79] The Tribunal accepts this and is therefore inclined to use Perenco's contemporaneous analysis of the impact of Decree 662 as a check on its own estimation of the Blocks' values.

124. Professor Kalt initially testified that he recalled having seen Perenco's internal calculations of Law 42's effect at 50% and 99% on its interests in the Blocks but then indicated that he was not sure whether he had seen Perenco's spreadsheets. In any event, he stated that he did not find it relevant to discuss them in his reports.[80] This was an understandable position for him to take because it was consistent with his view that the single date approach to valuation should be taken. Since the Tribunal has *not* taken the 'single date' approach, however, it considers Perenco's NPV calculations to be relevant evidence of its view of the Blocks' values in October 2007 with and without Law 42 at 99%. Obviously, that value would change over time depending upon a host of factors, but it is a good way to check the results that the Tribunal arrives at.

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78 Exhibit BR-27 and Exhibit BR-28, Spreadsheet analyses for Block 21, which were also attached to Exhibit BR-26, PERPROD0032722 (emails exchanged internally regarding impact of Law 42 at 99%).

79 Kalt ER III, paragraph 54.

80 Tr. Q. (5) 1333:5-16, 1334:1-4 (Kalt). "Q. Do you understand this e-mail to reflect what Perenco thought at the time would be what would happen in all probability had it continued with the Contracts? A. Well, I don't know. They've obviously done some kind of analysis of that nature. But I can't tell all the assumptions that they are putting in here. They're doing some calculation of that. They're trying to understand something about the impact of Decree 662 on them obviously, but I don't know all the assumptions that go into this. I don't know.…Q. …but did you ever see a copy of those spreadsheets? A. I don't know. I don't recall."

5. Summary of the Tribunal's General Approach

125. The point of departure therefore is the Tribunal's view that it must estimate the damages proximately caused by each breach and that this must be done as of the date of their occurrence. Accordingly, the Tribunal considers primarily on an *ex ante* basis (and referring to contemporaneous evidence where possible):

(i) the financial impact of Decree 662 on Perenco's interests in the Blocks as of the date of the first completed breach, 4 October 2007, with a view to estimating the compensation for the damage caused by that breach;

(ii) and in relation to the foregoing, Decree 662's specific impact on Perenco's drilling plans at the time so as to estimate what they would have been through to contract expiry for both Blocks in the 'but for' world (because this issue drives the expected levels of production and hence the projections of cash flows in the 'but for' world);

(iii) the damages to which Perenco is entitled as a result of the termination of its contractual rights in relation to Blocks 7 and 21;

(iv) whether, in the 'but for' world, Perenco would have enjoyed an extension of its operatorship in Block 7 after August 2010;

(v) Ecuador's 'true-up' submissions to determine whether any damages calculated under the foregoing heads need to be adjusted; and

(vi) the applicable rates of interest (to the date of the Award and to the date of payment of the Award).

126. Based on its various findings and conclusions, the Tribunal will then estimate the quantum of damages that should be awarded to Perenco using a 'harmonised model' that draws from the work of both sides' financial experts.

D. The Quantum of Damages for Decree 662, the First Completed Breach

127. The Tribunal did not find a breach of contract or of treaty for Law 42 at 50% and therefore no damages can flow for Law 42 dues at 50%, at least until the promulgation of Decree 662, for the simple fact that no unlawful act was committed until 4 October 2007.[81] The

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[81] As the ILC Articles state in Article 31(2), Reparation: "Injury includes any damage, whether material or moral, *caused by the internationally wrongful act* of a State." Commentary (9) notes in this regard that it is "*only* '[i]njury … caused by the internationally wrongful act of a State' for which full reparation must be made." [Emphasis added.]

question is whether or how the analysis changes as of that date. This affects the analysis on the drilling programme and in turn the volume of oil produced in the 'but for' scenario.

1. Economy of the contracts – Whether Law 42 would have been completely absorbed

(a) Perenco's Position

128. Perenco argued that the economy of the Contracts was the specific contractual bargain reflected in the economic clauses of the Contracts themselves, which guaranteed Perenco's full exposure to oil prices regardless of IRR.[82] Dr. Pérez Loose and Professor Aguilar both agreed that, under Ecuadorian law, the '*economy*' of a contract designates the balance of rights and obligations that determined the economic benefits of the contract for the parties.[83] This also defined the risks that each party would bear during the performance of the contract.[84]

129. The evidence confirmed that Law 42 triggered the clauses. Perenco would have exercised its '*absorption*' rights in a 'but for' world. The Tribunal must assume that Ecuador would have honoured its legal obligations in good faith.

130. Perenco argued that it had not lost its '*absorption*' rights whether on grounds of *res judicata* or waiver. First, the Tribunal has not expressly decided the issue and has not rejected it. The Tribunal found only that Perenco had not established that Ecuador breached Perenco's '*absorption*' rights before Decree 662. Ecuador's argument, that the Tribunal's decision to reject Perenco's claim that it was futile to exercise its rights when Law 42 applied at 50% should be applied *mutatis mutandis* to the situation where Law 42 applied at 99%, is incorrect because the Tribunal held that pursuing the clauses was indeed futile after Decree 662.

131. Second, Perenco had not waived those rights. Perenco had paid the Law 42 dues on a '*bajo protesta*' ('*without prejudice*') basis. It had invoked the Renegotiation Clauses through its

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82 Cl. PHB Q., paragraph 58.

83 *Ibid.*, paragraph 59.

84 *Id.*

December 2006 letters. Perenco also claimed a breach of the clauses in this arbitration. Even if Perenco's attempts to invoke the clauses were not exercised sufficiently vigorously in relation to Law 42 at 50%, this did not amount to a waiver of its rights under Ecuadorian law. Dr. Pérez Loose's testimony that nothing obliged Perenco to exercise the rights within a particular time was unchallenged.[85] The evidence and testimony of Perenco's witnesses also confirmed that Perenco continued to seek discussions with Ecuador through various avenues. Seeking an abatement of Law 42 was one of the key objectives that Perenco's CEO set for the Ecuador team in 2007.[86] Mr. Combe and Mr. d'Argentré both testified that they did intend to further assert Perenco's absorption rights, but were attempting to find the right opportunity to do so.[87] This was confirmed by Mr. Márquez.[88]

132. Ecuador's argument that the clauses mandated nothing more than negotiation must be rejected based on the Tribunal's findings and the evidence. The Tribunal had already rejected Ecuador's contention that the Renegotiation Clauses mandated only that the Parties negotiate a mutually agreeable offset.[89] The Tribunal found that the absorption clauses "did stipulate the ultimate result, namely, a change in the parties' respective participations 'which absorbs the increase or decrease in the tax burden.'"[90] Ecuador conflated the clauses' mandated result (full absorption) and the precise means to reach that result (good-faith negotiations). The December 2006 letters confirm Perenco's contemporaneous understanding of the absorption clauses, for example: "the Consortium will present the numbers which illustrate [the] economic impact on the Contract[s], in order to determine the percentage of participation which should be adjusted in favor of the Contractor."[91]

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85 Cl. PHB Q., paragraph 108, citing Tr. Q. (3) 901:9-12 (Pérez Loose); Loose ER VI, paragraph 25-27.

86 Márquez WS II, paragraphs 8-9; CE-323, p. 6.

87 See Combe WS II, paragraphs 7, 9, 12-16 and d'Argentré WS V, paragraphs 2-3.

88 Márquez WS II, paragraphs 26-31.

89 Cl. Rep. Q., paragraph 152 *responding to* Resp. C-Mem. Q., paragraph 190; see also *ibid.* paragraph 161, 201.

90 Decision on Liability, paragraph 365.

91 Cl. Rep. Q., paragraph 156 quoting Decision on Liability, paragraph 379; referring further to Combe WS II, paragraph 18.

133. Ecuador's alternative partial absorption theory was not what the Contracts provide. They required that the correction absorb the increase or decrease in the tax burden, not only an increment of the new tax.

(b) Ecuador's Position

134. Ecuador stated that its position throughout this arbitration has been that since the economy of the contract was never disturbed, the invocation of the Participation Contracts' taxation modification clauses would not have led to an adjustment of Perenco's participation, and therefore no damages are due.[92] Ecuador argued that the economy of the contract was a mathematical-economic equation underlying Clauses 8.1 of the Participation Contracts which was either the Consortium's expected average revenue of US$15/bbl or the Consortium's expected internal rate of return of around 15%.[93] Perenco's claim to full absorption found no support in the Participation Contracts themselves (noting in this regard that the Tribunal had found that the Renegotiation Clauses "did not stipulate how the correction factor was to be calculated").[94] Further, Perenco's reliance on Ecuador's alleged past practice in relation to VAT, SOTE and ECORAE charges is entirely misplaced.

135. Even if the Tribunal were to consider that modification was necessary so that the Consortium might enjoy some form of unspecified 'upside' potential on oil prices, such modification would not simply be to absorb the difference between Law 42 at 50% and 99% but only to absorb such amount necessary to provide the Consortium with the 'upside' exposure to oil prices to which the Tribunal appeared to consider that the Consortium was entitled. As Brattle explained, on this theory, Law 42 would apply to the Consortium at a rate of 81% for Block 21 and 99% for Block 7, but even at those rates, no modification of the X factors was necessary.[95]

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92 Resp. PHB Q., paragraphs 78-79.

93 *Ibid.*, paragraph 141.

94 Resp. C-Mem. Q., paragraph 141, citing Decision on Liability, paragraph 365.

95 Resp. C-Mem. Q., paragraph 142.

136. It argued further that since the Tribunal found that once Law 42 at 50% was implemented, "it was incumbent upon [Perenco] to make its case … at that time"[96] and since Perenco did not do so, it was too late to do so in the quantum phase by arguing it would have invoked its rights "but for" Decree 662.[97] Ecuador considered that Perenco was relying on self-serving evidence, "non-credible *ex post facto* testimonies" such as Mr. Márquez's statement that Perenco was simply waiting for the right opportunity to discuss the matter properly.[98] The simple truth was that, whether it believed the process was futile or not, Perenco had determined not to seek the application of the Renegotiation Clauses with respect to Law 42 at 50%.[99]

137. Ecuador argued therefore that Perenco could not now seek to invoke the Renegotiation Clauses in the quantum phase to claim full absorption of Law 42.

(c) The Tribunal's Decision

138. The issue is whether the damages to be awarded in respect of Decree 662 should be calculated (i) for the entirety of the 99% of the extraordinary revenues set by the Decree; (ii) for the additional 49% (*i.e.* above Law 42 at 50%) of the above-reference price value required to be collected by Decree 662; or (iii) on some other basis.

139. The Tribunal begins by recalling that its Decision on Liability contains a finding that bears on this issue. At paragraph 703, it stated:

> "In the end, the narrow question for the Tribunal is whether Perenco, having sought the aid of the Tribunal, could then take comfort that its refusal to pay the 2008 Law 42 dues to Ecuador would protect it in this arbitration without any potentially adverse consequences. The Tribunal has carefully considered the Parties' positions. It considers that Perenco had a right to expect that Ecuador would desist from enforcing the *coactivas* during the pendency of the arbitration. It also considers that in deciding to withhold all Law 42 amounts claimed in 2008, Perenco assumed that the Tribunal would accept its claims that none of the Law 42 dues claimed by the State were permissible under the Contracts or the

96 Decision on Liability, paragraph 394.

97 Resp. PHB Q, paragraph 58.

98 Resp. Rej. Q., paragraph 257.

99 Resp. C-Mem. Q., paragraph 148.

> Treaty. Given that Perenco has not made out its claims in respect of Law 42 at 50%, the Tribunal holds that even though Ecuador should have complied with the Decision on Provisional Measures, the *coactivas* ought not to be included in the Tribunal's analysis of the measures said collectively to constitute an indirect expropriation…In addition, to the extent that Perenco has succeeded in its claim that the application of Decree 662 at 99% violated Article 4 of the Treaty, as found at paragraphs 606-607 above, the enforcement of the *coactivas* to collect the claimed additional 49% constituted a breach of the fair and equitable treatment standard, but it was not an expropriation of the investment.)"[100] [Emphasis added.]

140. The precise wording of this finding precludes awarding damages for Law 42's effect prior to the first breach. But the Tribunal also found that futility was proven as of 4 October 2007.[101] Beyond that, the Tribunal did not pass on what might be considered in the damages phase with respect to the possible exercise of the tax modification clauses (except to note how the contracts' provisions were expected to operate).[102]

141. For the purposes of its damages analysis, the Tribunal considers that it must be assumed that if Perenco exercised its contractual rights in the 'but for' scenario, Ecuador would have responded in good faith by negotiating an absorption of the additional tax burden effected by Decree 662. After considering the evidence, the Tribunal finds that in the 'but for' scenario for the period after Decree 662 came into effect, Perenco would have sought an offset. But having regard to the evidence as whole, the Tribunal is not convinced that Perenco would have sought the complete elimination of Law 42 (*i.e.* stabilisation at 0%). Rather, it would have sought to undo the effect of Decree 662 and, to the extent reasonably possible, Law 42.

142. The Tribunal's reasoning in this respect is straightforward: (i) it was clear to all that Ecuador was moving away from participation contracts and could be expected to require that any new contracts that it might grant would not follow that model; (ii) even in the 'but for' world, this change in the country's hydrocarbons exploitation policy would exist as a lawful fact; (iii) the Block 7 Participation Contract was approaching its expiry (in August

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100 Decision on Liability, paragraph 703.

101 *Ibid.*, paragraph 411.

102 *Ibid.*, paragraphs 395-398.

2010) and Perenco was well aware of that fact and the need to adjust its expectations in order to have any chance of obtaining an extension of its operatorship in Block 7; and (iv) it is common ground between the Parties and was well understood at the time that Block 7 was the more valuable of the two Blocks.

143. In these circumstances, the Tribunal believes that Perenco would have recognised that the extraordinary returns generated under the Participation Contracts due to the significant increase in oil prices starting in the early 2000s were, for Ecuador, practically-speaking unsustainable, having regard to the financial implications of the windfalls that had been generated from the country's finite hydrocarbon resources under this form of contract. Moreover, Perenco's interest in obtaining a contractual extension for Block 7 would have provided a strong incentive for it to moderate its demands in seeking the full absorption of Law 42. In short, the Tribunal believes that in the 'but for' world, Perenco would have been most likely to seek a negotiation under the tax modification clauses that would have reduced the State's take of the extraordinary revenues, whilst maximising the company's chances of its obtaining an extension of its operatorship of Block 7.

144. The Tribunal thus holds that after Decree 662 entered into effect, Perenco would have been prompted to trigger negotiations and the Parties would have agreed to Law 42 being stabilised at 33% starting 5 October 2008, to be applied prospectively, for both contracts.

145. The Tribunal adds that while it might be that in the 'but for' world Perenco would use the occasion of the tax modification negotiations simultaneously to seek a Block 7 extension, it cannot be safely assumed that Ecuador would have agreed to an extension. The extension issue is therefore addressed separately below.

146. The Tribunal holds that Perenco's interests in the two Participation Contracts would be adjusted to a stabilised Law 42 rate of 33% as of 5 October 2008 through to contract expiry.

2. Estimating the Direct Financial Impact of Law 42 at 99%

147. In terms of valuing the direct financial impact of Decree 662, Perenco's NPV calculation performed just after Decree 662 was promulgated permitted the Tribunal to perform a rough estimate of the value of the company's interests in the Blocks by subtracting the total

value of the revenues foregone in the remaining years of the Contracts in order to arrive at an estimate of the residual value of Perenco's interests (what might be termed the "below Decree 662 reference price" value). This was also valued by Brattle and the results are as follows:

Points of differences	**Perenco in 2007**	**Brattle (1st Report)**[103]	**Brattle (2nd Report)**[104] **– Updated using RPS's Costs**	**Brattle (2nd Report)**[105] **– Updated using Prof. Kalt's Costs**
Value of Block 7 with Law 42	NPV: $122.1 million	FMV: $109.1 million	FMV: $111.3 million	FMV: $114.5 million
Value of Block 21 with Law 42	NPV: $117.3 million	FMV: $156.6 million[106]	FMV: $170.9 million	FMV: $181.3 million
Total Value of Blocks with Law 42 *(c.f. Perenco's 2007 calculations)*	**$239.4 million**	**$265.7 million** *(+$26.3 million)*	**$282.2 million** *(+$42.8 million)*	**$295.8 million** *(+$56.4 million)*
Value of Block 7 with Decree 662	NPV: $84.1 million	FMV: $58.8 million	FMV: $59.1 million	FMV: $58.8 million
Value of Block 21 with Decree 662	NPV: $70.5 million	FMV: $48.9 million[107]***	FMV: $68.5 million	FMV: $68.7 million
Total Value of Blocks with Decree 662 *(c.f. Perenco's 2007 calculations)*	**$154.6 million**	**$107.7 million** *(-$46.9 million)*	**$127.6 million** *(-$27 million)*	**$127.5 million** *(-$27.1 million)*
Fall in value of Block 7 due to Decree 662	$38 million	$50.3 million	$52.2 million	$55.7 million
Fall in value of Block 21 due to Decree 662	$46.8 million	$107.7 million	$102.4 million	$112.6 million
Total Loss in Value *(c.f. Perenco's 2007 calculations)*	**$85 million**	**$158 million** *(+$73 million)*	**$154 million** *(+$69 million)*	**$167 million** *(+$82 million)*

148. In the Tribunal's view, these estimates provide a useful check against the damages estimate.

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103 Brattle ER II, fn. 157.

104 Brattle Table M.

105 *Id.*

106 Brattle explained that they assumed higher prices and costs than Perenco's models and more production.

107 Brattle explained that their model assumes higher operating costs.

149. To arrive at a final amount calculated on an *ex ante* basis, it is necessary to estimate how many wells Perenco would have drilled in the 'but for' world. Here the Parties' oilfields experts (Perenco's Mr. Crick, acting not as an independent expert, but rather as a fact witness with certain technical expertise, and RPS, Ecuador's technical experts) held very different views as to what that drilling activity would have been undertaken but for Decree 662, an issue to which the Tribunal now turns.

3. Decree 662's Impact on Perenco's Drilling Plans for Block 7 and Block 21

150. The evidence is that the decree led to a virtually immediate stoppage in the Consortium's drilling operations.[108] In Exhibit BR-26, the Perenco email which contained the results of the company's NPV calculations, there was some discussion about continuing with the plan to drill Oso 23.[109] But this was the sole exception to the cessation of drilling activity. Charts depicting the company's well-drilling history produced at the Tribunal's request after the Quantum Hearing showed that while Perenco drilled 11 wells in Block 21 in 2005, 13 in 2006 and one in 2007, it did not drill any wells in 2008 or in the first half of 2009 (whereupon it suspended operations).[110] Likewise, for Block 7, Perenco drilled six wells in 2005, 11 in 2006 and five in 2007, but it did not drill any wells in 2008 or in the first half of 2009.[111]

151. The Tribunal has no doubt that but for Decree 662, in the absence of its securing an extension of the Block 7 Participation Contract, Perenco would have drilled more wells in Block 7 up to August 2009 (one year before the Contract's expiry, whereupon Perenco would have ceased drilling wells due to the need to ensure an adequate payback before

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108 Cl. Mem. Q., paragraph 47; d'Argentré WS V, paragraph 16; Perrodo WS II, paragraph 7.

109 Exhibit BR-26: In response to Mr. Daniel Kadjar's query, "Do you recommend to drill Oso-23 and release the rig afterwards or to release the rig after Oso-22?", Mr. d'Argentré wrote in an email, "If we drill the OSO23 we must explain to the state that this is the last one and that we do it because of contractual obligation with the drilling contractor, and that it is obviously difficult to stop a campaign so quickly. In other words, we don't want the state to believe that we carry on drilling because it is still profitable. To answer your question I think we should drill OSO23 and send our termination notification to H&P in the meantime. We have all drilling equipment ready plus the NPV is still around 3.7M$."

110 Block 21 Wells Chart for Tribunal produced on 15 December 2015 by way of email.

111 *Id.*

contract expiry[112]). As for Block 21 (which, at the time of Decree 662's promulgation, still had some 14 years left before the Contract expired), the Tribunal has to estimate a reasonable drilling programme for that Block, which programme might reasonably be expected to extend past the declaration of *caducidad*.

152. This exercise is also potentially bound up in the evaluation of the drilling activities after the declaration of *caducidad* in that there are two periods with which the Tribunal is concerned: (i) from 4 October 2007 to 20 July 2010; and (i) from 21 July 2010 to contract expiry. This means weighing the Consortium's actual plans up to 4 October 2007 which were then put on hold and considering what would, on a balance of probabilities, likely have happened in both blocks had Decree 662 not been promulgated. This will be used for the first period. The Tribunal will then perform a further estimate as to what would have happened after the declaration of *caducidad*.

153. This necessarily raises the question of the fate of the Block 7 Contract because Mr. Crick indicated that the Consortium would have continued drilling in Block 7 at least up to August 2009. He testified that this was when, in the absence of an extension, Perenco would stop drilling new wells due to the need to enjoy a suitable payback period before surrendering Block 7 to Ecuador.[113] Accordingly, the Tribunal will first consider whether, in the 'but for' world, Perenco would have enjoyed an extension of its operatorship in Block 7 after August 2010.

(a) The question of an extension of the Block 7 Contract after August 2010

154. With good reason, the Parties have argued this issue at considerable length, since it accounted for a substantial portion of Perenco's revised claim of a total of US$1.493 billion in damages. (See Brattle's Waterfall Chart reproduced above at paragraph 65.) As already

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112 Tr. Q. (3) 627:14-22 (Mr. Crick's Direct Presentation).

113 Crick WS II, paragraph 147: "I have assumed that Perenco would have achieved an average of one well per month, and I assume that it would have stopped any new investments one year before the end of the contract. [August 2010 expiry date for the Block 7 Contract]."

noted, Perenco's rights under the contract to the Block 7 Oso Field were the most valuable of Perenco's Ecuadorian assets.[114]

155. According to the Contract, Perenco's interest in Block 7 was to expire on 16 August 2010, and as events transpired, this occurred some 27 days after the declaration of *caducidad* was issued.[115]

156. The Contract contained a clause that permitted the Contract to be extended in certain circumstances:

> "**Clause 6.2 Production Period**: In this case, the Production Period shall last until August sixteenth (16), two thousand ten (2010); this term may be extended, provided that it is in the State's best interest, for the following reasons:
>
> - When the Production area is located far from existing hydrocarbon production infrastructure, with the prior approval of the Ministry of Energy and Mines and for a period of up to five (5) years;
> - When the Contractor proposes significant new investments during the last five (5) years of the Production Period, with the prior agreement of the Ministry of Energy and Mines and the approval of the CEL, provided that adequate amortization periods are required for those investments;
> - If the Commercially Exploitable Hydrocarbon Deposits are discovered as an exclusive result of new exploration work performed by the Contractor, the Production Period shall be extended with the prior agreement of the Ministry of Energy and Mines and the approval of the CEL."[116]

(i) Perenco's Position

157. Perenco argued vigorously that its contractual rights would not have expired, but rather in the 'but for' world it would have been permitted to operate the field in some form or another. In this regard, it pointed to evidence of other extensions granted by Ecuador to

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114 Perenco's Chairman, François Perrodo, likewise stated that the Block 7 Contract extension was a "high priority" for Perenco and that Perenco was prepared to offer significant value to obtain an extension. Perrodo WS II, paragraph 10.

115 *Caducidad* was declared on 20 July 2010.

116 CE-17.

operators during the relevant period.[117] It also noted that even during the time that it operated under Decree 662 at 99%, it was negotiating an alternative arrangement with Petroecuador – the so-called *Acta*– and that the parties had arrived at an agreement which was not consummated because Perenco's fellow consortium member, Burlington, having decided to withdraw from Ecuador, refused to agree to its terms. As the Tribunal found, this refusal of its fellow Consortium member was essentially held against Perenco by Ecuador.[118]

[1] Ecuador did not have unfettered discretion whether or not to grant an extension

158. Perenco argued first that the evidence showed that a good faith exercise of Ecuador's discretion under Clause 6.2 would more likely than not have led to an extension of Perenco's Block 7 operatorship. Ecuador did not have unfettered discretion to refuse to extend Perenco's Block 7 operatorship. As Dr. Pérez Loose testified, a fair reading of Clause 6.2 would be that when any of the three circumstances for extension were met,[119] the State's best interest was presumptively satisfied and Ecuador was obliged to grant an extension.[120]

[2] The Parties could have agreed to extend on different terms

159. Perenco also contested Ecuador's reading of Clause 6.2 to the effect that it permitted only an extension of the expiration date of Block 7 Contract, and no amendments of any of the

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117 Cl. Rep. Q., paragraph 168 relying on Resp. C-Mem. Q, paragraph 118 which cites the amended contracts for Block 10, Block 14, Block 16, Block 17, MDC, PBHI and Tarapoa.

118 Decision on Liability, paragraph 619.

119 Loose ER VI, paragraph 38: "Clause 6.2 established Perenco's right to have the term of the contract extended provided that certain conditions are met: (i) when the "production area is located far from the existing petroleum hydrocarbons infrastructure..."; (ii) when the Contractor proposes •significant new investments in the last five (5) [years] of the Production Period…[a] and "provided adequate amortization periods are required for said investments"; and (iii) when there is a •...discovery of new Commercially Producible Hydrocarbons Deposits exclusively as the result of new exploration work done by the Contractor...'".

120 Cl. PHB Q., paragraph 66. Tr. Q. (4) 932:20-933:8 (Pérez Loose); *see also* Tr. Q. (3) 903:4-10 (Pérez Loose), Tr. Q. (4) 924:6-10, 928:3-8 (Pérez Loose); Loose ER VII, paragraph 52.

contract's other terms, as being both unsupported by the contractual language and unrealistic. It was indeed discredited by Ecuador's own sweeping practice of extending the operatorships of existing contractors on amended contractual terms.[121]

160. Ecuador had not contested the fact that it was prepared to extend Perenco's Block 7 operatorship on different terms from the existing ones, and that it would have done so had it complied with its international and contractual obligations. Ecuador's witnesses such as Messrs. Dávalos, Palacios, Pinto, and Chiriboga repeatedly acknowledged during the merits phase that they wanted Perenco to continue operating in Block 7.[122] As for Perenco's witnesses, they confirmed that the extension was a high priority for the company and that they believed that they could have reached an agreement with Ecuador but for the unlawful acts. This was corroborated by contemporaneous internal documents and correspondence with Ecuador and was not tested on cross-examination.[123]

161. The Parties' mutual interest in extending Perenco's operations in Block 7 was consistent with the longstanding historical practice in the upstream oil industry generally, and especially in Ecuador, to extend the contracts of incumbent operators. According to Mr.

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121 Resp. C-Mem. Q, paragraph 118 which cites the amended contracts for Block 10, Block 14, Block 16, Block 17, MDC, PBHI and Tarapoa but asserting that these contracts were not extended.

122 See Palacios WS I, paragraph 22; Palacios WS II, paragraphs 25, 33: Pinto WS I, paragraphs 22-23; Pinto WS II, paragraphs 9, 17-18; Chiriboga WS I, paragraphs 12-13; Tr. Q. (4) 936:2-17 (Chiriboga). Counsel for Perenco also submitted: "Ecuador —and this will be a theme of my presentation— was always, Members of the Tribunal, a very reasonable partner. Also in his letter of the 1st of March 2006, President Palacio has stated the following: 'On repeated occasions I have invited the oil companies that have contracts with the Ecuadorian State to initiate processes of reaching an understanding for the equitable distribution of the extraordinary earnings. Nonetheless, these invitations have not been responded to, a situation that further justifies the reforms proposed without this meaning that the renegotiation process has been closed.' Well, at the same time President Palacio was submitting the draft of what became Law 42, President Palacio was expressly saying that the negotiation could be possible, that he expected —he hoped that he could actually go to the table, at the table with the oil companies and discuss the oil contracts. […]

As a rapid review of the essential facts from Law 42 to the termination of the Participation Contracts through *caducidad* shows, Ecuador was always a reasonable partner. You saw that in the invitations to negotiate in 2005. You saw that in the letter of President Palacio of the 1st of March 2006. And, hence, Ecuador was always willing to negotiate, but let's go right away to the facts …" (Tr. M. (1) 275:10-22; 276:1-6; 281:4-11).

123 Cl. PHB Q., paragraph 117 referring to CE-323, p. 6; Exhibit BR-32, Slide 36; E-387, Slide 103; CE-324.

Dávalos' testimony on redirect examination, Ecuador apparently declined to extend contracts only twice over the past three decades.[124]

162. In 2010 alone, Ecuador executed seven amended oil contracts, extending the terms of six of the original contracts by between six and fifteen years.[125]

163. Ultimately, Perenco was open to concluding a reasonable services contract for the extension period. Perenco argued that Ecuador did not deny that it would be reasonable to assume that the extension terms would have been somewhere between the parties' initial negotiating positions, and somewhat closer to Ecuador's initial position than to Perenco's, a reasonable proxy for which is effectively Law 42 at 37.5%. The Eni (AGIP) services contract extension provides strong support for this conclusion. That was a services contract in a neighbouring block in which Ecuador agreed to an eleven-year extension. Perenco specifically considered an AGIP-type contract as part of its contemporaneous extension strategy. Therefore, that contract is a good benchmark for the terms that Ecuador would have accepted for an extension. Perenco noted that Brattle's reports offered no opinion on any extension case.

[3] Extension would have been in Ecuador's best interests

164. As for Ecuador's argument that it would have been negligent for the State to extend Perenco's operatorship of Block 7 because the economic proposition was unattractive, Perenco argued that Ecuador's assertion relied on a flawed economic analysis. In Perenco's view, Professor Dow's analysis assessed the value of a Block 7 extension to only extend to the acceleration of investment and production, but failed to assess the benefits of partnering with experienced private contractors. In any event, Professor Dow also undervalued the benefit of such acceleration.

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124 Tr. Q. (3) 792:9-793:6, 830:14-832:5 (Dávalos).

125 See http://www.hidrocarburos.gob.ec/biblioteca/ (website of the Hydrocarbons Secretariat, containing links to the amended contracts for Block 10, Block 14, Block 16, Block 17, MDC, PBHI, and Tarapoa). Cl. Mem. Q., paragraph 146.

165. At the Quantum Hearing, Professor Dow conceded that a contract extension would have resulted in benefits to Ecuador exceeding the amount paid to Perenco and would thus be in Ecuador's best interest.[126] Professor Dow admitted that Ecuador's costs of capital during the 2008 to 2010 period were likely to be much higher than Perenco's 12% cost of capital and that in his calculations of the extension value he failed to account for the high opportunity costs of Ecuador's having to invest its own capital in the oil industry instead of in the public sector.[127]

166. Further, Ecuador failed to adduce any evidence to support its claims that its policy to migrate to services contracts and Perenco's allegedly unsatisfactory environmental practices meant that extending Perenco's operatorship was not in Ecuador's interest.[128]

[4] Perenco had met the conditions for extension under Clause 6.2

167. Perenco asserted further that it had met the two conditions for extension under Clause 6.2.

168. First, its discovery of oil in the Hollín reservoir in the Oso field met the requirement of discovery of new "Commercially Exploitable Hydrocarbon Deposits." These were "those deposits of Crude Oil which, in the judgment of the Contractor, are commercial deposits and are included in an approved Development Plan or an Additional Development Plan." Perenco did not need to discover new fields. It was immaterial that Perenco had not raised its discovery of the Oso Hollín deposit as a possible ground for extension in its September 2007 Budget Committee Meeting ("BCM").

169. Second, it proposed significant new investments during the last five years of the Contract. Perenco had proposed drilling up to 16 further wells in its 2006 Oso Plan of Development and their positive results would have led to substantial further investment which would in turn have been grounds for an extension of the Contract. In September 2007, Perenco also planned to propose additional projects in exchange for a Block 7 extension. Even during

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126 Tr. Q. (5) 1458:1-12, 1560:1-8 (Dow); Tr. Q. (5) 1560:12-1561:3 (Dow). Tr. Q. (5) 1560:20-1561:3 (Dow); *see also* Brattle ER III, paragraph 172.

127 Tr. Q. (5) 1567:16-1568:5 (Dow); Tr. Q. (5) 1462:14-16 (Dow) *cf.* Tr. Q. (5) 1284:20-1285:7 (Kalt).

128 Cl. PHB Q., paragraph 120.

the 2008 negotiations, Perenco agreed to a minimum investment of US$110 million in Block 7.

[5] Perenco would have drilled 70 new wells in the event of an extension to 2018

170. On the assumption that Block 7 would have been extended, albeit on different terms, Mr. Crick's 'but for' drilling plan for Block 7 focused mainly on the Oso Field. Perenco observes that not only did it propose precisely the 70 wells included in Mr. Crick's programme in its 2008 Internal Review, but Petroamazonas has now drilled some 105 new wells in Oso, and based on its April 2014 Oso Development Plan, it intends to drill 28 more.[129] Petroamazonas is on track to drill roughly double the number of Oso wells that Mr. Crick planned.[130] This was confirmed at the Quantum Hearing by Mr. d'Argentré[131] and Mr. Crick.[132]

171. Mr. Crick's analysis was reviewed by Dr. Strickland, the Claimant's independent expert in these proceedings. His C.V. includes 37 years' experience performing and supervising reservoir engineering and geological projects including field studies, economic valuations, audits and field unitizations.[133]

172. Dr. Strickland reviewed Mr. Crick's plan and noted that these numbers were based on a development plan that Perenco created in late 2008 and appeared reasonable in light of the much greater development of the field that Petroamazonas had since undertaken.[134] Since 2009, Petroamazonas had drilled 142 wells in Block 7, 105 of which have been in Oso.[135]

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129 Cl. Rep. Q., paragraph 89.

130 See Chart of Block 7 Wells submitted 15 December 2015.

131 Tr. Q. (2) 520:1-11, Tr. Q. (3) 623:19-624:2.

132 Tr. Q. (3) 627:10-628:5.

133 Strickland ER I, paragraphs 5-8.

134 Exhibit Strickland Reference 6, Ryder Scott Report dated 30 June 2013; Exhibit Strickland Reference 11, ECPROD29062, Profundidad Total Pozos.xlsx.

135 Crick WS II, Appendix U.

173. Perenco argued that these developments would be carried out during an extension of Perenco's Block 7 operatorship to 2018. The most recent data received from Ecuador in June 2015 indicated that Petroamazonas would shortly be turning its attention to the precise reservoirs that Mr. Crick has slated for waterflooding.[136]

174. Mr. Crick's latest and revised numbers for the production volumes in Block 7 were:[137]

BLOCK 7				
		Original Term		With Extension
From Existing Wells	from 01/08/2009 to 16/08/2010		from 01/08/2009 to 16/08/2018	
	Coca Payamino	1 605 545		9 693 365
	Other block 7	2 651 148		13 818 821
Net Gain from new Wells				
	from 01/12/2007 to 16/08/2010		from 01/12/2007 to 16/08/2018	
	Coca Payamino		Coca Payamino	20 448 190
	Other block 7	**13 473 339**	Other block 7	78 533 142
Block 7 Totals		**17 730 032**		**122 493 518**

[6] Form and value of an extension

175. Perenco argued that given the essentially unrebutted evidence that Ecuador and Perenco would have agreed to an extension in Block 7, the only question remaining was the economic terms on which such extension would have been granted. Since the 2008 *acta* terms were the product of what the Tribunal has already held to be coercion,[138] terms agreed without such coercion would naturally have been more favourable to Perenco.[139]

176. In Perenco's submission, the Quantum Hearing demonstrated the reasonableness of Professor Kalt's approach to estimating the extension's value. Ecuador did not deny that it would be reasonable to assume that the extension terms would have been somewhere

136 Cl. Rep. Q., paragraph 91.

137 Crick WS III, Figure 1, Revised forecast for Blocks 7 and 21.

138 Decision on Liability, paragraphs 606, 609, 612, 686.

139 Tr. Q. (1) 150:20-151:10 (Cl. Opening); see also Cl. Mem. Q., paragraphs 151-152, 177; JK ER III, paragraphs 133-134.

between the parties' initial negotiating positions, and somewhat closer to Ecuador's initial position than to Perenco's, a reasonable proxy for which is effectively Law 42 at 37.5%.[140]

177. Perenco's approach towards determining the value of the contract extension is therefore a reasonable proxy for the value that would have been generated in a fair negotiation between the parties had Ecuador never acted unlawfully. Perenco has even assumed that Ecuador would have done better in the negotiations and adjusted the bid-and-ask meeting point to the lower quartile of the difference between Perenco's 'best case' scenario (no Law 42) and Ecuador's 'best case' scenario (Law 42 at 50%).[141]

178. In Perenco's submission, the AGIP services contract extension[142] provides strong support for this conclusion.[143] That was a services contract (hence consistent with Ecuador's claimed policy direction) in a neighbouring block in which Ecuador agreed to an 11-year extension, so it was nearly 40% longer than the period of the extension that Perenco claims in this arbitration. Perenco specifically considered an AGIP-type contract as part of its contemporaneous "extension strategy."[144] Therefore, the contract is a good benchmark for the terms Ecuador would have accepted for an extension. Whether it is used to corroborate Professor Kalt's approach[145], or as a substitute approach, the result is comparable.

179. Relying upon Professor Kalt's analysis, Perenco argued that the quantum of damages owed to Perenco in respect to the extension of Block 7 is in the area of US$600 to 625 million (US$626 million based on Law 42 at 37.5% or US$604 million based on the AGIP contract,

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140 See Tr. Q. (1) 147:11-148:14 (Cl. Opening); Tr. Q. (5) 1348:2-8 (Kalt); see also Cl. Mem. Q., paragraphs 148-154, 173-176; Cl. Rep. Q. paragraph 179; d'Argentré WS V paragraphs 24-27; Márquez WS II, paragraph 39; JK ER III, paragraphs 130-132.

141 Kalt ER III, paragraphs 130-132.

142 CE-328.

143 *Cf.* Tr. Q. (1) 149:16-150:1 (Cl. Opening); Cl. Mem. Q., paragraph 153.

144 See *e.g.*, E-387, Slides 105, 107; BR-32, Slides 36-37; see also Tr. Q. (1) 149:16-150:1 (Cl. Opening), Cl. Mem. Q., paragraph 153.

145 Cl. PHB Q., paragraph 130 referring to Tr. Q. (5) 1448:21-1449:2 (Kalt) and Kalt ER IV, paragraphs 5, 9, 125-126; JK-64.

used as a proxy for which Perenco and Ecuador would have agreed in the 'but for' world).[146]

(ii) Ecuador's Position

180. Ecuador argued that Block 7 would not have been extended for a variety of reasons, including: (i) Ecuador had the discretion to grant or not an extension, but not to extend it on different terms; (ii) it would not have been in the State's interests to grant the extension; and (iii) Perenco had not met the requirements to trigger the exercise of discretion under Clause 6.2 of the Contract. The issue before the Tribunal was whether the Participation Contract should somehow be extended, not whether it would have been renegotiated into an AGIP-kind of services contract. Moreover, the facts showed that renegotiation failed due to, among other reasons, Burlington's decision not to engage in a renegotiation but rather to exit Ecuador.[147]

[1] Ecuador enjoyed ample discretion to grant or not an extension of the Block 7 Participation Contract

181. Ecuador argued that the Quantum Hearing demonstrated that Clause 6.2 of the Block 7 Participation Contract encompassed two layers of discretion – the State: (i) "*may*" extend the existing contract; and (ii) "*if and when it is in the State's best interest*" – which discretion was triggered, if and only if, at least one of the three technical requirements under Clause 6.2 was satisfied.

182. As to the first layer of discretion, the wording of Clause 6.2 of the Contract was clear ("*…this term may be extended, if and when it is in the State's best interest, for the following reasons…*" [Emphasis added.]). This granted ample discretion to Ecuador to decide whether to extend, or not, the term of the existing Contract's Production Period. In Ecuador's view, Dr. Pérez Loose was unable to escape the language of Clause 6.2[148] and

146 Kalt ER IV, Exhibit JK-64.

147 Resp. Rep. PHB Q., paragraph 20.

148 Tr. Q. (4) 921:14-21 (Pérez Loose).

Mr. Perrodo had candidly recognised Ecuador's discretionary power to grant or not an extension.[149]

183. Ecuador criticised Perenco's proposed interpretation for failing to give effect to the expressed intention of the parties[150]; it did not give effect to Clause 6.2 as a whole[151] as Dr. Pérez Loose ultimately acknowledged under cross-examination[152]; and the word "*shall*" in sub-clause 6.2.3 could not override the word "*may*" in the *chapeau* of Clause 6.2 which commanded the entire provision. Sub-clause 6.2.3 related to the act of obtaining the prior agreement of the Ministry of Energy and Mines, and the approval of the Special Bidding Committee.

184. Perenco also could not prove a purported practice in Ecuador of extending all oil contracts because there was no such practice. As Dr. Dávalos had testified, there were two instances (Texaco and Sinopec) when Ecuador had not granted an extension because they were not in its best interests.[153] Even if there were such a practice, this could not legally override the discretion that Ecuador held under Clause 6.2.

185. Finally, Perenco could not rely on the good faith principle under Ecuadorian law to transform the word "*may*" into "*shall*."

[2] *An extension of the Block 7 Participation Contract would not have been in the State's best interest*

186. Clause 6.2 provided a second layer of discretion reserved to the State, given that the Production Period may only be extended "*if and when it is in the State's best interest*." As Dr. Aguilar explained, in establishing the public interest, the State must see first whether the event has occurred. If that occurred, the next step was to decide whether or not it was

149 Tr. Q. (2) 562: 17-563:18 (Perrodo).

150 Resp. PHB Q., paragraph 30.

151 *Ibid.*, paragraph 31.

152 Tr. Q. (4) 827:2-929:6 (Pérez Loose).

153 Tr. Q. (3) 792:12-793:8 and Tr. Q. (3) 830:10-832:5 (Dávalos).

appropriate to extend the Contract.[154] Extending the Participation Contract would not have been in Ecuador's best interests for the following reasons.

187. First, Ecuador had chosen at the relevant time to adopt a policy of migration from participation contracts to services contracts. Contrary to Perenco's contention, Ecuador's witnesses had testified to the failed renegotiation of the Participation Contracts and not to the potential extension of the Block 7 Participation Contract.[155] Even if Perenco argued that it would have accepted a different model for the extension of its Block 7 operatorship, Perenco had only calculated the Block 7 extension value based on Law 42 at 37.5%; this must mean that this was an extension under a participation contract (as Law 42 only applied to such contracts), Perenco's last minute change of the basis of its valuation to employ AGIP's services contract must be therefore be dismissed outright.

188. Second, it would have been uneconomical for Ecuador. Ecuador was not just guided by economic gain, but by a plethora of objectives. Perenco's expert, Dr. Pérez Loose, was forced to retract his proposition that the State's interests were reduced to obtaining the largest amount of oil possible, as he ultimately admitted that they encompassed other issues, such as health, the environment, defence, *etc*.[156] Perenco could not rely on *ex post facto* evidence from its own witnesses as to the purported benefits of an extension, and that it was a high priority for Perenco, to argue that Parties would have agreed on the extension.[157]

189. Third, Perenco was not a responsible environmental steward, and it would likely be held liable for having caused contamination in the Blocks.

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154 Tr. Q. (4) 985:10-12 (Aguilar).

155 Resp. Rep. PHB Q., paragraph 21.

156 Tr. Q. (4) 935:20-936:15 and Tr. Q. (3) 904:18-905:1 (Pérez Loose).

157 Resp. Rep. PHB Q., paragraph 22.

[3] Perenco did not meet the technical requirements under Clause 6.2

190. Perenco suggested that Ecuador had not disproved at the Quantum Hearing that the two technical requirements in Clause 6.2 invoked by Perenco were met. On the one hand, the burden of proof falls on Perenco. On the other hand, and as shown by Ecuador in its Post-Hearing Brief[158], Perenco failed to demonstrate that it satisfied even one of the technical requirements under Clause 6.2.

191. In this respect, Perenco failed to show that it had discovered new Commercially Exploitable Hydrocarbon Deposits as an exclusive result of new exploration work pursuant to Clause 6.2.3. The evidence adduced at the Quantum Hearing confirmed that Perenco benefited from existing log data already showing the presence of oil in the Hollín. Mr. Combe also confirmed that BP, Perenco's predecessor in the Block, had conducted the first exploration activities at Oso in the 1980s.[159] The presence of oil was confirmed in 1988[160] and Perenco was in possession of this information before it drilled Oso 3.[161]

192. Therefore, Perenco had not included this alleged discovery when it drilled the Oso 3 well in the Hollín reservoir as part of its strategy for extension in the September 2007 Budget Committee Meeting. Nor did it allocate any value to an extension when it calculated the NPV of its investment in 2007.

193. Perenco did not propose significant new investments before the Participation Contract's expiry in order to qualify for an extension. The Quantum Hearing confirmed that Perenco knew full well that an extension of the Production Period was uncertain. As a consequence, from 2007 onwards, Perenco acted accordingly and accelerated investments and project development to ensure payback within the contract's term:

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158 Resp. PHB Q., Section 3.1.3.

159 Tr. Q. (2) 345:16-346:10 (Combe).

160 Tr. Q. (2) 348:19-17 (Combe).

161 Tr. Q. (2) 350:5-16 (Combe).

> "Q. So, Mr. Perrodo, is it fair to say that, from 2007, absent a contract extension, Perenco would only make investments in Block 7 that could be amortized or paid back before August 2010?
> A. […] my decision was to, you know, make as much money as possible in case, you know, we wouldn't be granted an extension, which is clearly not what we wished for, but that's the reason why we decided to accelerate the developments."[162]

[4] Even in a hypothetical extension scenario, Mr. Crick's drilling programme would not have occurred

194. Ecuador further criticises Perenco's Block 7 extension scenario, with the 127-well[163] waterflood project advocated by Mr. Crick, as being yet another "cynical attempt by Perenco to grossly inflate" its claim.[164] Mr. Crick had based his forecast on a flawed methodology. This flaw was most readily apparent from the significant discrepancy between Mr. Crick's forecasted production and the actual production from the Oso field.

195. The only 2 single well pilot projects undertaken at the Lobo and Coca-Payamino fields failed to establish the continuity of the Napo U formation rock, the cornerstone for a successful waterflood project. Confronted with the fact that the pilot well at Lobo did not have the same impact on two equidistant wells, Mr. Crick conceded that this could be due to the discontinuity of the formation rock in this field.[165] Dr. Strickland was also forced to acknowledge that the results from the limited study undertaken (*i.e.*, one injector well in each of the Lobo and Payamino fields) show heterogeneity (or discontinuity) in the tested Napo reservoir.[166]

196. Perenco's subsequent attempt to argue that Mr. Crick's "5-spot" development pattern would de-risk the development and account for any discontinuities only reinforced the inconclusive results obtained by the Consortium. Perenco was equally misplaced in seeking

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162 Tr. Q. (2) 562:5-8, 14-18 (Perrodo). See also Perrodo WS II, paragraphs 6-7.

163 Tr. Q. (3) 623:22 -624:2 (Crick's Direct Presentation): "Had there been an extension, we would have drilled 70 wells and an additional 120 wells for waterflooding in other Block 7 reservoirs."

164 Resp. Rep. PHB Q., paragraph.76.

165 Tr. Q. (3) 723:4-9 (Crick).

166 Tr. Q. (4) 1052:2 (Strickland).

to support Mr. Crick's 127-well waterflood project through documents reflecting the risky investments proposed by the Consortium during the contract extension negotiations.[167] In fact, Ecuador argued, these documents: (i) showed that the Consortium was only contemplating a maximum of 29 waterflood wells in an extension scenario;, and (ii) did not even mention a '5-spot' development pattern.[168]

197. Ecuador argued that Perenco persisted with Mr. Crick's 37-well waterflood project in the Basal Tena reservoir in Coca-Payamino without even having undertaken any pilot testing in this reservoir and notwithstanding Mr. d'Argentré's acknowledging that, for a waterflood project to work, the concept must first be proved in the reservoir.[169] Even Dr. Strickland had to concede that, "[i]n the Basal Tena, […] the waterflood reserves are more uncertain there because no pilot has been instigated" causing "greater uncertainty,"[170] thereby further undermining Mr. Crick's waterflood project.

198. Further, *ex post* data, on which Perenco so heavily relied, did not support waterflooding as a viable development strategy in Block 7. Indeed, Ryder Scott —a company specialised in waterflood projects[171]— had not once mentioned it in its reports to Petroamazonas.

199. Finally, Perenco was incorrect in alleging that Mr. Combe and Mr. d'Argentré provided support for Mr. Crick's waterflood project. Mr. Combe never even addressed waterflooding.[172] Mr. d'Argentré did, but his testimony could hardly be presented as supporting Mr. Crick's extensive waterflood project given that: (i) he did not know how many wells Mr. Crick was proposing to drill as part of this project; and (ii) he did not think Mr. Crick was proposing a lot of development in those fields, because they were already developed.[173] Perenco failed to point to any evidence indicating that the Consortium

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167 Cl. PHB Q., paragraph 30.

168 Crick WS II, Appendix L, Slides 114-119.

169 Resp. PHB Q., paragraph 112 citing Tr. Q. (2) 495:2-9 (d'Argentré).

170 Tr. Q. (4) 1087:12-15 (Strickland).

171 CE-333, p. 2.

172 Resp. Rep. PHB Q., paragraph 76.

173 Tr. Q. (2) 494:2-8 (d'Argentré).

partners were considering to embark upon Mr. Crick's extensive and costly waterflood project in the northern part of the Block. Mr. Combe conceded that the Consortium "envisioned that all the development or future development would be around Oso."[174]

[5] Form and value of an extension

200. Ecuador argued that both sides' experts confirmed at the Hearing the unreasonableness of Perenco's extraordinarily high extension value (presenting over 40% of Perenco's claimed damages). The DCF analysis should not include a hypothetical extension, even more so when Perenco's contemporaneous assumptions did not assign any value to a potential extension.

201. In assessing the purported value of a hypothetical extension, Professor Kalt did not apply the terms of the *Actas de Acuerdo Parcial* of 2008. Instead, Perenco came up with its own terms for a new contract.[175] Professor Kalt did not calculate a value for a renegotiated services contract (in light of Ecuador's policy to migrate to services contracts), and therefore Perenco failed to discharge its burden of proof.

202. On the economics of extension, the issue was not whether extension could have created benefits for Ecuador, but what price Ecuador would have been willing to pay for those benefits. Perenco's terms assumed that Ecuador would have agreed to pay more than the economic benefits it could have expected from an extension. Brattle amply demonstrated that it would have made no economic sense for Ecuador to agree to an extension on Perenco's terms because they gave "more than 100 percent share of the [value generated by the extension] for the Contractor."[176]

203. Ecuador framed the issue as follows: Ecuador would agree to pay Perenco on top of the standard return an additional US$626 million for Perenco to continue operating Block 7 until 2018 when Ecuador was due to receive the fields for free in August 2010 (*i.e.* at

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174 Tr. Q. (2) 326:16-17 (Combe).

175 Kalt ER IV, paragraph 126 – damages due to Perenco assuming the extension terms contained in the *Actas de Acuerdo Parcial* of 2008 would amount to US$1.144 million as of July 2015.

176 Tr. Q. (5) 1463:1-1464:7 (Dow); Brattle ER II, paragraphs 141-176; Brattle ER III, paragraphs 137-155.

contract expiration) and any contractor could have taken over the operations then – only if Perenco offered Ecuador benefits no other contractor could. The only unique benefit Perenco could articulate at the Quantum Hearing was Mr. Crick's purported knowledge of the fields – and that Ecuador would have granted an 800% IRR which Professor Kalt asserted would be worth $968 million.[177] However, this would already be part of the costs in Brattle's model, together with the other benefits that any other operator could provide. Thus, Ecuador's cost of borrowing is irrelevant: Ecuador could contract with another private contractor, as it did with YPF in Block 21.

204. In response to Perenco's criticism that "Professor Dow's analysis wrongly assumed that Ecuador could have reaped all of the extension benefits – except acceleration – for free",[178] Ecuador explained that a zero NPV (for the acceleration) did not mean that the costs are zero, but the costs had already been factored into the calculation (through the discount rate). Brattle had assumed that Ecuador would pay for an extension the standard return (discount rate) offered to contractors (*i.e.* 12%).

205. Finally, Ecuador pointed out that Perenco's claim (to justify its unrealistic extension terms) that Ecuador agreed in the AGIP contract to a 25% rate of return on invested capital was misleading because (i) the 25% rate of return in the AGIP contract relates exclusively to investments in exploration or secondary recovery techniques, *i.e.* high-risk investments[179]; and (ii) for production from existing fields, the AGIP contract sets a $35 tariff/barrel produced. The AGIP contract was thus not a good comparable to Block 7.

(iii)The Tribunal's Decision

206. The Tribunal has carefully considered this important issue and begins by setting out some general findings that have guided its analysis.

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177 Tr. Q. (5) 1387:1 (Kalt) ("But what you don't have is judgment"); Tr. Q. (5) 1380:18-1381:3 (Kalt); Tr. Q. (5) 1387:17-20 (Kalt) ("But the new employees wouldn't carry the decision-making judgment that goes into actually making the key decisions on the running of an oilfield"); Tr. Q. (5) 1445:9-20 (Kalt); Tr. Q. (5) 1384:8-20 (Kalt).

178 Cl. PHB Q., paragraph 122.

179 E-379, AGIP Contract dated 23 November 2010, Clause 12.3.

207. First, it takes note of the submissions concerning the precise wording of Clause 6.2 of the Participation Contract. It accepts Ecuador's argument that the State had a substantial measure of discretion when it came to deciding whether to grant an extension. Perenco itself accepted that Clause 6.2 was discretionary and the Tribunal did not find persuasive Dr. Pérez Loose's attempt to narrow the scope of Ecuador's discretion so as to make contract extension virtually mandatory.[180]

208. Second, the Tribunal considers that even in the 'but for' world an "extension" would at its best, from Perenco's perspective, not have entailed an extension of the existing Participation Contract, but rather the Parties would have agreed that a new model would govern their relationship. Given the way in which the Parties' arguments developed, the Tribunal considers that Perenco essentially conceded this to be the case.[181] Hence its argument that a services contract in some form would be granted and Law 42 at 37.5% was used as a proxy for the specific terms that the Parties could have agreed for the extension period had Ecuador not acted unlawfully.[182] Third, the Tribunal takes note of Ecuador's evidence that some contracts were not extended.[183] This however is not very compelling evidence; Mr. Dávalos, when cross-examined on this point, was able to identify only two such instances of non-extension over the past three decades.[184] Moreover, Ecuador did not tender any witnesses to testify that the State would not have extended the operatorship at issue in the instant case and given that earlier in the proceeding, different witnesses,

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180 Tr. Q. (4) 932:20-933:8 (Pérez Loose); *see also* Tr. Q. (3) 903:4-10 (Pérez Loose), Tr. Q. (4) 924:6-10, 928:3-8 (Pérez Loose); Loose ER VII, paragraph 52.

181 Perenco asserted: "Ecuador's reading of Clause 6.2 to permit only an extension of the expiration date of the Block 7 Contract, and no amendments to any other terms, is unsupported by the contractual language and unrealistic." (Cl. Rep. Q., paragraph 164).

182 Cl. Rep. Q., paragraph 171. See also Cl. PHB Q., paragraph 120: "The unrebutted evidence also shows that Perenco was open to concluding a reasonable services contract for the extension period. Cf. Tr. Q. (1) 137:14-16 (Cl. Opening); see also PRQ [Cl. Rep. Q.], paragraph 165-170; d'Argentré WS V, paragraph 24 ('Perenco was prepared to accept less favorable economic terms during a Block 7 extension'); E-387, Slides 105, 107; BR-32, Slides 36-37 ('Block 7 extension strategy guidelines: . . . [c]hange the type of contract: a service contract')."

183 Tr. Q. (3) 792:8-793:6, 830:14-832:5 (Dávalos).

184 Tr. Q. (3) 792:8-793:6, 830:14-832:5.

including former ministers, conceded that Ecuador wanted Perenco to continue to operate, the absence of such testimony is telling.

209. The record evidence in fact suggests a willingness on the State's part to deal with incumbent operators. As counsel for Perenco pointed out in closing argument:

> "… in 2010, Ecuador executed seven amended contracts, extending the terms of all of them, and in 2014, Ecuador extended the terms of three expiring Services Contracts with another three operators. Thus, even if Ecuador had discretion to grant an extension, so long as it was exercised in good faith, the facts compel a conclusion that Ecuador would, indeed, have extended Perenco's term in Block 7."[185]

210. The evidence of extensions also accords with common sense. There are considerations of convenience resulting from the incumbent's knowledge of and experience with the unique operating characteristics of each oilfield, the operator's access to a lower cost of capital than that which the State could achieve[186], the professional relationships between operators and their counterparts in the State's regulatory apparatus, and so on.

211. The Tribunal is convinced that there is substantial evidence that, all other things being equal, senior officials and ministers of Ecuador would have preferred that Perenco continue its operatorship of Block 7 rather than its leaving the Block. There is a substantial body of evidence on the record to support this finding in addition to the general evidence showing that Ecuador tended to extend operatorships.[187]

212. The fundamental problem for the extension claim is that it is not possible, on the evidence before it, for the Tribunal to know *what* contractual terms might have been arrived at in a successful negotiation but for the unlawful acts. Having regard to the situation in the last quarter of calendar year 2008, the Tribunal recalls that, as Perenco asserted in its pleadings

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185 Tr. Q. (6) 1701:6-14.

186 Tr. Q. (5) 1567:16-1568:5 (Dow); Tr. Q. (5) 1462:14-16 (Dow); *cf.* Tr. Q. (5) 1284:20-1285:7 (Kalt).

187 As pointed out by Perenco in Cl. Mem. Q., paragraph 146: "In 2010 alone, Ecuador executed seven amended oil contracts, extending the terms of six of the original contracts by between six and fifteen years. See http://www.hidrocarburos.gob.ec/biblioteca/ (website of the Hydrocarbons Secretariat, containing links to the amended contracts for Block 10, Block 14, Block 16, Block 17, MDC, PBHI, and Tarapoa)." See also CE-331 and CE-332.

during the merits phase, it did sign the Minutes of Partial Agreement (the actual title of the *Actas*), and did what it could to reach a solution acceptable to all parties.[188] But it faced Burlington's disinterest, Ecuador's insistence that both members of the Consortium agree to the new arrangement, and the fact that the minutes themselves did not constitute a binding legal agreement.

213. In this regard, the Tribunal recalls what Perenco asserted during the merits phase of the arbitration:

> The Minutes were, rather, without prejudice minutes of the parties' negotiations, which set forth certain commercial issues on the basis of which the parties agreed to continue their negotiations. RMP WS ¶¶ 31-33, 58-59. The Minutes contained an express reservation of all rights; they stated on their face that they were not binding; and they expressly referred to the need for all parties (including Burlington) to execute duly agreed contractual modifications before any of the points recorded in the Minutes could take effect. See RMP WS ¶ 32; see also, e.g., E-84, p. 2 ("The parties declare that the information contained in the present Minutes of Partial Agreement . . . will not be binding."); ibid. p. 2 ("The parties declare that these agreements will be incorporated into the general negotiations that will take place in the following days and will concern mainly the following points: Arbitration and Mediation Clause. . . . "); E-87, ¶ 6 and E-89, ¶ 8 ("For the application and validity of this agreement the parties shall negotiate and execute the Transitory Participation Contracts . . .."); E-87, p. 2 ("This agreement is without prejudice and does not constitute a waiver of the rights to which Perenco Ecuador Limited and PETROECUADOR believe they are entitled . . . .") and E-89, p. 2 ("The agreements contained in these minutes are without prejudice and do not constitute a waiver of the rights to which Perenco Ecuador Limited and PETROECUADOR believe they are entitled . . .."). It was perfectly clear to all concerned that no binding agreement modifying the Contracts could be reached without Burlington's agreement. See also GCZ WS ¶ 24 (acknowledging the Minutes were subject to Burlington approval).[189] [Emphasis added.]

214. Indeed, when defending its inability to persuade Burlington to continue negotiations, Perenco argued that "Burlington cannot be faulted for refusing to accept *the vague,*

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188 Cl. Rep. M., paragraph 490.

189 *Ibid.*, paragraph 491.

incomplete and risky substitute contract it was being offered *and to take on faith that its economic interests would be preserved.*"[190] [Emphasis added.]

215. This is the fundamental difficulty facing this claim. The October 2008 *Acta*, which is the last indication of an apparent shared 'in principle' intention to establish a contractual basis for the Consortium's continued operation of Block 7, was in the form of "minutes" and itself was not put into final legal form. The intention of the parties at the time was that, if finally agreed, the *Acta* would be a transitory agreement that would be succeeded by some form of services contract. But the final expression of the *Acta* itself, let alone the expression of the parties' respective rights and obligations in the contract that would follow, were never reduced to writing. In the end, the Tribunal considers that Perenco's characterisation of the *Acta* as a "*vague, incomplete and risky substitute contract*" illustrates the inherent difficulties of choosing a proxy for the Block 7 extension scenario.

216. Perenco saw the AGIP Contract as a proxy for what would have happened to Block 7 and adverted to the fact that it had considered a contract of this type as part of its extension negotiation strategy.[191] This part of its damages claim therefore married together the financial aspects of that contract with Mr. Crick's 'but for' drilling programme for Block 7.

217. But this approach founders on Perenco's concession that there is no record evidence that *Ecuador* ever considered that the AGIP Contract could be a model for an extension of the Block 7 operatorship for Perenco.[192] For all of these reasons, the idea of employing a

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190 *Ibid.*, paragraph 495.

191 See Cl. PHB Q., paragraph 130: "The Eni (AGIP) services contract extension (CE-328) provides strong support for this conclusion. Cf. Tr. Q. (1) 149:16-150:1 (Cl. Opening); PMQ ¶ 153. That was a services contract (hence consistent with Ecuador's claimed policy direction) in a neighboring block in which Ecuador agreed to an eleven-year extension, so one that was nearly 40% longer than what Perenco claims in this arbitration. Perenco specifically considered an Eni-type contract as part of its contemporaneous 'extension strategy' *See, e.g.*, **E-387**, Slides 105, 107; **BR-32**, Slides 36-37; see also Tr. Q. (1) 149:16-150:1 (Cl. Opening), PMQ ¶ 153. "Therefore, the Eni contract is a good benchmark for the terms Ecuador would have accepted for an extension. Whether it is used to corroborate Prof. Kalt's approach (see Tr. Q. (5) 1448:21-1449:2 (Kalt); JK ER IV ¶¶ 5, 9, 125-126; JK-64), or as a substitute approach, the result is comparable."

192 Tr. Q. (6) 1704:8-12 (Claimant's Closing Argument).

services contract like the Block 10 AGIP Contract as a proxy for what might or might not have been agreed for Block 7 is, in the end, a bridge too far for the Tribunal.

218. The Tribunal has also taken note of the fact that much of Perenco's damages analysis is based on what Petroamazonas has done since it assumed operation of the Blocks. But the Tribunal is not convinced that the economics of the operations of Petroamazonas, a State–owned entity, provides an appropriate "apples to apples" comparator of what Perenco would have done in the 'but for' scenario.[193]

219. As a matter of law, the Tribunal is also mindful of the fact that the decisions of international courts, tribunals, and claims commissions show that while financially assessable damages are to be awarded, the adjudicator must seek to avoid awarding speculative damages. As the *BG Group* tribunal noted:

> "…Damages that are 'too indirect, remote, and uncertain to be appraised' are to be excluded. In line with this principle, the Tribunal would add that an award for damages which are speculative would equally run afoul of "full reparation" under the ILC Draft Articles."[194]

220. Having regard to all of the circumstances, therefore, the Tribunal considers that it is too remote, uncertain and ultimately too speculative to accept Perenco's extension argument, particularly when Perenco itself accepted that it is necessary to use other contractual models as a proxy for what *might* have been agreed between the Parties. At the end of the day, it simply cannot be ruled out that the Parties might have been unable to arrive at an agreement or for its own reasons the State might have simply decided in an exercise of its lawful discretion not to extend the Block 7 contract. There is, therefore, in the present circumstances an insufficient degree of confidence as to the terms of a contract that might have been concluded such that there could be an estimate of lost cash flows.

221. All of that said, the Tribunal is firmly of the view that Perenco has adduced persuasive evidence that it suffered a loss of opportunity and further that this loss is compensable. The

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193 *Murphy v. Ecuador* took a similar approach in rejecting that claimant's reliance on what Repsol achieved in after it took over operations from Murphy. See *Murphy v. Ecuador*, paragraph 485.

194 CA-004, *BG Group v. Argentine Republic*, UNCITRAL, Final Award, 24 December 2007, paragraph 428.

Tribunal notes in this regard that the *Burlington* tribunal found that the claimant in that case did not make out its 'loss of opportunity' claim. But this points to a key difference in the facts before the *Burlington* tribunal and those before the present Tribunal. The *Burlington* tribunal appears to have been influenced by the fact that Burlington itself appeared to have assigned a zero value to the chance of a contract extension in 2007.[195] The evidence before the present Tribunal is quite different. As the Tribunal's Decision on Liability found, Perenco sought ways to preserve its presence in Ecuador and to arrive at some form of accommodation with the State.[196] Indeed, the Tribunal found that Ecuador's holding Burlington's recalcitrance against Perenco constituted a breach of the Treaty.[197] It also appears that Burlington and Perenco argued over the course of action to be followed.[198] In these circumstances, the Tribunal is of the view that in the 'but for' world of dealings between Perenco and Ecuador, there was a real opportunity for the incumbent operator to extend its operation of Block 7, which opportunity was lost due to the unlawful conduct of the State.

222. The loss of opportunity is thus established and compensable and the Tribunal's estimate of that loss is addressed below in Section II.I.10.

223. The upshot of the foregoing analysis is that since the Tribunal has found that it cannot assume that the extension of Block 7 would have been based on the AGIP contract or some other proxy, Mr. Crick's drilling plans for Block 7 for the period after the date of the Block 7 Contract's expiry on 16 August 2010 cannot be taken into consideration. With the Participation Contract's having come to an end shortly after the expropriation, there is no basis for considering the hypothetical drilling plans that might have been implemented had the Contract been extended.[199]

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195 *Burlington* award, paragraph 282.

196 Decision on Liability, paragraphs 620-625.

197 *Ibid.*, paragraph 626.

198 E-91, Letter from Burlington to Perenco dated 16 December 2008 in which Burlington: "...wish[ed] to clarify that Burlington is not under any legal obligation of any kind to sign the draft agreements. Burlington is entitled to stand on its rights under existing PSCs, and those rights cannot be modified without Burlington's effective participation."

199 The *Burlington* tribunal reached the same conclusion. *Burlington* award, paragraphs 271-278.

224. The Tribunal turns to the 'but for' drilling scenarios.

(b) Block 7 'but for' drilling programme from Decree 662 to August 2010

225. Since the Block 7 Participation Contract expired in August 2010 and in light of the Tribunal's finding above, the Tribunal is concerned only with the impact of Decree 662 upon the Consortium's drilling activities in Block 7 up to August 2010.

(i) Perenco's position

226. Having regard to the August 2010 contract expiry scenario, Mr. Crick estimated that 21 new wells (of a total of 70 new wells in the extension scenario) would be drilled. Perenco notes that, as Mr. Crick explained, for the Oso 19-26 grouping, the average well had a 6-month payback period and outperformed even the "high case" predicted at the time of drilling.[200] In fact, Oso 23, the last well that Perenco drilled shortly after Decree 662 was promulgated, was the best well yet.[201]

227. Perenco argued that with three years remaining on the Block 7 Contract, in October 2007 it was far from being in a "shut-down mode" and the Consortium was not intending to limit Block 7 drilling to Oso wells which were expected to pay out the drilling investment by mid-2007. Following completion of the 8 firm Oso wells in the 2006 Plan of Development ("POD"), the Consortium would have begun drilling the 8 contingent wells contemplated by the Plan; those wells would have been re-categorised as "firm" wells. Perenco noted in this regard that it was common practice in Ecuador to budget only "firm" wells, with the operator later submitting budget adjustments when the "contingent" wells were moved into the "firm" category.[202]

228. Both Mr. Combe and Mr. d'Argentré testified that the September 2007 BCM presentation showed that Perenco had substantially expanded its estimates of Oso's oil in place and

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200 Crick Direct Presentation Q., Slide 9.

201 Crick WS III, paragraph 156.

202 Cl. Rep. Q., paragraph 81, citing Crick WS III, paragraph 147; d'Argentré WS IV, paragraphs 9-11, Combe WS III, paragraph 9.

planned to move more personnel to Oso and to build a new camp to accommodate them, and further that the Consortium had constructed the infrastructure backbone for further Oso development.[203] Perenco needed time to process the "exciting results" from the firm wells before choosing additional locations.[204] A rig was available to keep drilling.[205]

229. But for Decree 662, Perenco argued, it would have continued to drill one well per month in Oso, just as it was doing at the time that Decree 662 came into effect and it would have continued this drilling programme for as long as it remained profitable to do so.[206] Perenco asserted that this ought not to be controversial: further Oso wells would undeniably produce new reserves[207] and Perenco indisputably had previously achieved a one-well-per-month drilling schedule in Oso.[208]

230. No reasonable operator, amid rising oil prices and excellent results, would decide not to drill further wells.[209] As soon as contract renegotiations were underway, Perenco proposed initially 33, then 70, new Oso drilling locations – hardly a hallmark of disappointment (as alleged by RPS).[210] Perenco would have continued drilling further wells so long as they would pay for themselves and make a return prior to contract expiry. Such further drilling would have been particularly attractive given the high oil price environment, and given the fact that estimates of the amount of oil in Oso "only grew with each new batch of wells."[211]

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203 Tr. Q. (2) 323:10-327:1 (Combe); Tr. Q. (2) 530:1-533:22 (d'Argentré); *c.f.* RPS ER IV, paragraphs 67, 81; E-387, Slides 15-17, 55-68, 85-94, 97-99.

204 Tr. Q. (2) 501:8-21, 506:16-510:12, 512:5-19, 534:1-535:20; see also d'Argentré WS VI, paragraphs 7-15; Combe WS III, paragraphs 9-11.

205 Tr. Q. (2) 435:1-8 (Combe).

206 Tr. Q. (2) 520:1-11 (d'Argentré); Tr. Q. (3) 623:19-62.4:2; 627:10-628:5 (Crick); Crick WS II, paragraph 147; Crick WS III, paragraphs 143-159; see also Tr. Q. (2) 327:2-13 (Combe); Combe WS II, paragraph 54; d'Argentré WS V, paragraph 16; d'Argentré WS VI, paragraph 14.

207 Tr. Q. (4) 1139:22-1140:12 (RPS).

208 Cl. PHB. Q., paragraph 25; Chart of Block 7 Wells submitted on 15 December 2015.

209 Cl. PHB. Q., paragraph 28.

210 See Exhibit BR-31, Slide 35 (2008 MTO); Crick WS II, Appendix L, Slides 31-32.

211 Cl. Rep. Q., paragraph 82 referring to Crick WS II, paragraphs 158-160; Crick WS III, paragraph 144; d'Argentré WS VI, paragraphs 6, 12-14.

(Perenco noted in this regard that Petroamazonas' estimates for Oso have continued this trend, indeed coming in much higher than Perenco's highest estimate.[212])

231. The only "uncertainty" was whether Oso was "excellent or merely very good."[213] While RPS asserted that the Oso field was not as promising as Mr. Crick asserted on the basis of four of the 13 Main Hollín wells that were already off production prior to June 2007, Dr. Strickland explained that in any given field, the number of "bad" wells can be expected to exceed the number of "good" wells.[214] For RPS to imply that Oso was somehow a poor performer based on the number of wells that had been taken off production was seriously misleading. The only reason for halting drilling at Oso was Decree 662's promulgation.[215]

232. As for the Lobo and Coca-Payamino fields, Mr. Crick also forecasted waterflood developments.[216] These were noted in Perenco's 2008 Internal Review and in the September 2007 BCM.[217] Dr. Strickland explained that this meant that produced water would be re-injected into the reservoir. He reviewed the Perenco pilot waterflood results and found that they showed the required good communication between the wells to implement a waterflood development. He further confirmed that Mr. Crick's methodology was consistent with industry practice and the proposed waterflood projects should be successful.[218] (Perenco also contended that this was validated by Ryder Scott, which had produced a reserves report for Petroamazonas in June 2013.[219])

233. The foregoing analysis was reviewed by Dr. Strickland who concluded that Mr. Crick's methodology was consistent with that employed by other buyers and sellers of international

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212 Cl. Rep. Q., paragraph 82 referring to Crick WS II, Appendix T; Crick WS III, paragraph 144 and Appendix P.

213 Cl. Rep. Q., paragraph 84 referring to Crick WS III, paragraph 154; Combe WS III, paragraph 13.

214 Cl. Rep. Q., paragraph 88, relying on Strickland ER II, paragraphs 73-79.

215 Cl. Rep. Q., paragraph 84; Cl. Mem. Q., paragraph 46 referring to d'Argentré WS V, paragraph 13.

216 Cl. Rep. Q., paragraph 90.

217 Cl. Rep. Q., paragraph 90 referring to Crick WS II, Appendix L, pp. 34 – 38; E-387, pp. 114-122.

218 Strickland ER I, paragraph 87.

219 *Ibid.*, paragraph 88.

oil and gas assets and was applicable to the particular fields under review. Dr. Strickland's own production numbers were:[220]

Block 7 Existing Wells Forecast Expected Ultimate Recovery (MMStb) Initial Production to 8/16/2018			
Field Name	Forecast Method		
	Rate Time MMStb	Rate Cum MMStb	Average of Methods
Oso	19.9	19.8	
Lobo	6.5	6.5	
Coco-Payamino	67.1	67.1	
All Others	22.7	22.7	
Sum of Block 7 Fields	116.2	116.1	116.2
Analysis of John Crick			118.5

234. Dr. Strickland noted that Mr. Crick had used Petroamazonas' own production rates and used decline curve analysis. Dr. Strickland conducted an analysis of wells in Coca-Payamino, Oso and Lobo and combined Mono and Gacela. In applying the 'production performance analysis'/'decline curve analysis' methodologies,[221] Dr. Strickland found that the '*Water to Oil Ratio vs Cumulative*' method did not result in trends that could be conscientiously extrapolated to make a reliable forecast.[222] He instead summed up the results obtained using the '*Rate vs Time*' and '*Rate vs Cumulative*' methodologies to obtain the Expected Ultimate Recovery ("EUR") for Block 7.

235. All the fields except Lobo exhibited good trends under both methodologies. Lobo was the exception because that field was still being developed with the drilling of additional wells, such that the decline curve had not yet settled. Dr. Strickland made what he called a conservative extrapolation for Lobo. He then summed the EURs for the fields calculated

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220 Strickland ER II, paragraph 68.

221 Strickland ER I, paragraph 42: (1) Rate *vs* Time; (2) Type Curve; (3) Rate *vs* Cumulative; (4) Water to Oil Ratio *vs* Cumulative.

222 Strickland ER I, paragraph 81.

under each technique to determine the cumulative EUR for existing wells in Block 7. He averaged the EUR calculated and compared it to Mr. Crick's calculated EUR. Dr. Strickland found that Mr. Crick's EUR (118.5 MMStb) was a very close match to Dr. Strickland's EUR of 116.6 MMStb (higher only by 2%).[223] Mr. Crick's forecasts for the existing wells were thus in his view valid and reliable.

236. In response to RPS's argument that these developments were too uncertain and risky, during the Quantum Hearing both Mr. Crick and Dr. Strickland testified that the proposed "5-spot" development pattern for the waterfloods would effectively de-risk the development and account for any minor discontinuities in the reservoirs.[224]

(ii) Ecuador's Position

237. In Ecuador's view, the Quantum Hearing demonstrated that the Consortium did not intend to extend its drilling campaign at Oso beyond its 8-well commitment (*i.e.*, up to Oso 26).[225] The only additional drilling that the Consortium was envisaging beyond that was in the form of "risky" investments intended at the time to satisfy the investment requirement to be considered for an extension of the Block 7 Participation Contract. The Consortium, in short, was in a shut-down mode unless and until it was granted an extension.[226] RPS's conclusion that the Consortium would only have drilled up to 3 wells reflected the strategy set out in the September 2007 BCM and other contemporaneous documents[227], that is, that there would be no further drilling of the Oso Main Hollín reservoir beyond Oso 26, and the focus instead would be on "new investment" projects to be undertaken if negotiations for the extension of the Block 7 Participation Contract succeeded.

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223 *Ibid.* paragraph 84.

224 Tr. Q. (3) 729:17-731:10 (Crick); Tr. Q. (4) 1051:20-1052:7 (Strickland).

225 Tr. Q. (2) 503:20-504:4 (d'Argentré).

226 Resp. Rep. PHB Q., paragraph 72.

227 RPS ER V, paragraph 32; E-415, Consortium's Budget Committee Meeting Presentation, 28 September 2006; E-412, Consortium's Budget Committee Minutes, 28 September 2006; E-314 Information Committee Meeting, December 2006/15, p. 3; E-414, Consortium Presentation, 8 January 2007, p. 29; Exhibit BR-32, MTO Presentation, 22 March 2007, p. 53; E-387, Consortium's Budget Committee Meeting Presentation, 26-27 September 2007, pp. 51-53.

238. In response to Perenco's maintaining that even in the absence of an extension being granted it would have drilled 21 new wells at Oso from January 2008 onwards, Ecuador argued that there was no contemporaneous support for this drilling campaign. The September 2007 BCM made no reference to any drilling beyond Oso 26, even though Mr. d'Argentré acknowledged at the Quantum Hearing that such meetings were the forum for discussing further drilling.[228] He insisted that "the technical people on the background were exchanging information and discussing future wells."[229] Yet Perenco failed to provide proof of such discussions, which only confirmed the lack of evidence in support of its development programme. It was repeatedly made clear that drilling beyond Oso 26 was only envisaged in an extension scenario.[230]

239. Ecuador argued further that Perenco's reliance upon the proposed construction of a new camp at Oso as proof of the intention to engage in further drilling was misplaced, because it was not the "infrastructure backbone for further Oso development"[231], but rather was foreseen to rationalise existing production operations in Block 7.[232]

240. As conceded by Dr. Strickland at the Quantum Hearing, the commercially exploitable boundaries (or outer edges) to the south, east and north of the Oso field had all been reached by August 2006.[233] By late 2007, it only remained to be determined how far the Main Hollín reservoir extended to the west following the promising, yet still preliminary, results from Oso 21. As pointed out by RPS, faced with this uncertainty, Perenco had decided upon the safer option of infill drilling for the last three Oso wells contemplated on the eve of Decree 662, rather than investing in further (riskier) wells to probe the western flank of

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228 Tr. Q. (2) 510:2-6 (d'Argentré).

229 *Id.*

230 Tr. Q. (2) 516:20-522:18 (d'Argentré); Tr. Q. (3) 646:14-647:10 (Crick); Tr. Q. (4) 1077:9-1080:21 (Strickland); Tr. Q. (4) 1117:15-1118:18 (RPS).

231 Cl. PHB Q., paragraph 28.

232 E-387, Consortium's Budget Committee Meeting Presentation, 26-27 September 2007, p. 93.

233 Tr. Q. (4) 1077:9-1080:21 (Strickland).

that field. Perenco was thus in a "shut-down mode" pending an extension being secured for Block 7.

241. In fact, on the eve of Decree 662, Block 7 was not the success story that Perenco was now presenting. First, Perenco misleadingly relied on the Oso mapping update following the results of Oso 21 to suggest that the Consortium "substantially expanded its estimates of Oso's oil in place based on drilling results."[234] However, this increase was only reflected in the maps and was not further mentioned nor quantified during the September 2007 BCM.[235] More importantly, if the Consortium was as enthusiastic about Oso at the time as Perenco contended, the increase of oil in place would have encouraged the Consortium to schedule further drilling beyond January 2008. But it did not do so.

242. Second, Perenco disregarded the fact that it was not only a matter of some disappointing results, but of the location of the disappointing wells in question. RPS referred in this respect to the "poor results of the first 18 wells drilled in Oso field, particularly the results of the four failed Main Hollín wells."[236] These 4 wells, which were probing for the edges[237], indicated limited potential to the north, south, east, and southwest of the Oso field. As a result, Oso 21 and 23 were drilled in an apparent effort to test the northwest extension of the reservoir. As explained by RPS, the mixed results that these wells yielded, coupled with the looming contract expiry in 2010 and the poor quality of the seismic data in the western flank, would have persuaded the Consortium to limit additional drilling to three infill wells (Oso 24, 25 and 26), *i.e.*, between Oso 21 and 23, and wells drilled of the main northern drilling pad (Oso 9). Once Petroamazonas took over operations, it benefited from new seismic data which allowed it to further step-out drilling to the north and to the west.[238]

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234 Cl. PHB Q., paragraph 28.

235 E-387, Consortium's Budget Committee Meeting Presentation, 26-27 September 2007, pp. 55-68.

236 RPS' Direct Presentation, Slide 31; RPS ER V, paragraphs 74-75 and Appendix B.

237 Tr. Q. (4) 1077:9-1080:21 (Strickland).

238 Resp. Rep. PHB Q., paragraph 75.

243. Further, the development programme would have required both an amendment to the Oso Development Plan and further authorisations from the Ecuadorian authorities.[239] It would also have required an extensive upgrade to the Block 7 facilities.[240] Not only would the looming contract expiry date not have allowed the Consortium to amortise the US $35 million necessary to undertake this upgrade, but there was also no evidence to show that the Consortium was even considering such a heavy investment absent an extension of the Block 7 Participation Contract.[241]

244. In contrast to Mr. Crick's estimates and Dr. Strickland's numbers, RPS's numbers were:[242]

4-Oct-07 (Case 1)	"Rest of Block 7" – Risked		
	Reserves Class/Category	Description	Reserves, MMStb
	1P Producing	Existing Wells at 04-Oct-2007	7.10
	1P Undeveloped	Three "but for" new wells	1.38
	Total 1P		8.48
	2P Producing	Existing Wells at 04-Oct-2007	8.55
	2P Undeveloped	Three "but for" new wells	1.84
	Total 2P		10.39

20-Jul-10 (Case 2)	"Rest of Block 7" - Risked and Adjusted *		
	Reserves Class/Category	Description	Reserves, MMStb
	1P Producing	Existing Wells at 20-Jul-2010	0.18
	Total 1P		0.18
	2P Producing	Existing Wells at 20-Jul-2010	0.18
	Total 2P		0.18

4-Oct-07 (Case 1)	Coca-Payamino – Risked		
	Reserves Class/Category	Description	Reserves, MMStb
	1P Producing	Existing Wells at 04-Oct-2007	3.88
	Total 1P		4.61
	2P Producing	Existing Wells at 04-Oct-2007	3.88
	Total 2P		4.61

239 Tr. Q. (2) 375:6-381:15 (Combe).

240 Crick WS II, Appendix C, pp. 20-21.

241 Brattle ER II, Section IV.A.5.

242 RPS ER V, Appendix V.

20-Jul-10 (Case 2)	Coca-Payamino - Risked and Adjusted *		
	Reserves Class/Category	Description	Reserves, MMStb
	1P Producing	Existing Wells at 20-Jul-2010	0.11
	Total 1P		0.11
	2P Producing	Existing Wells at 20-Jul-2010	0.11
	Total 2P		0.11

245. RPS asserted that its forecast for the existing wells was based on a well-by-well analysis consistent with industry valuation practice.[243] The reliability of RPS' analysis was confirmed by the fact that its 2P "most likely" forecast is within 10% of actual production.[244] Conversely, the forecast for the three new wells was derived from Perenco's own AFEs[245] for these wells. Under Case 2[246], RPS forecasted 289,200 barrels of 1P[247] and 2P[248] oil from the existing wells in Block 7[249], a figure undisputed by Perenco.

246. Ecuador and RPS criticised Mr. Crick's type-curve forecasting methodology (because he first determined the initial oil rate for his new wells, before applying to these (and to the existing) wells a type curve calculated at field level). This could be very imprecise, differing from reality by as much as 45%, as Mr. Crick himself acknowledged.[250]

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243 *Ibid.*, Section 2.2.

244 *Ibid.*, paragraph 95.

245 As explained by RPS in its Fourth Expert Report, fn. 35: An AFE, sometimes referred to as an Authorization for Financial Expenditure, is a document which itemizes the costs associated with projects requiring significant expenditures. The AFE is typically presented to management for approval before the work can commence. Economic justification for the expenditure is usually part of the "AFE package." For new wells, the justification will include, among other items, production forecasts for the life of the well, sometimes referred to as the AFE production prognosis.

246 Existing wells (includes wells drilled "but for Decree 662") as of 20 July 2010 through contract expiration on 16 August 2010; Forecast then adjusted by subtracting production attributable to wells drilled "but for Decree 662" – See RPS ER IV, Table 2.

247 1P (proved).

248 2P (proved plus probable).

249 RPS ER IV, Tables 8 and 9; RPS ER V, Appendix U.

250 Tr. Q. (3) 655-657:13 (Crick).

247. Mr. Crick's production figures were also grossly inflated as compared to the actual production of the Blocks. Mr. Crick's forecasting methodology not only failed to accurately forecast the past, but RPS also demonstrated that the results obtained by applying Mr. Crick's decline curve to each of the existing Oso wells from their initial production through to 31 March 2013 significantly exceeded (*i.e.* inflated) the actual production of the very wells for which Mr. Crick claimed to have obtained an excellent match. RPS undertook an independent check of Crick's forecasts and provided an apples-to-apples comparison with actual production, which resulted in an overstatement of reserves of Oso of 21 MMbo.[251]

248. RPS demonstrated that in order to achieve the claimed "excellent match" between his forecast and the actual production of the Perenco wells, Mr. Crick had adjusted the data, thereby discrediting his validation technique.[252] For the new wells, Dr. Strickland did not validate Mr. Crick's forecast for those wells, which represented some 99 MMbo out of his total forecast of 122.5 MMbo[253]. RPS also showed that Petroamazonas (unlike Perenco) had the capacity to handle a significant number of new wells and water production – beyond that of the 56 wells in Mr. Crick's analysis – with no operational restriction.[254] Therefore, contrary to what Perenco alleged,[255] the divergence between Mr. Crick's forecast and actual production could not be attributed to Petroamazonas' operational policies, but only to his flawed methodology.[256]

(iii)Perenco's response

249. In response to Ecuador's and RPS' arguments, Perenco argued that RPS had wrongly criticised Mr. Crick and Dr. Strickland for employing "aggregate" forecasting methods derived from group of wells. Mr. Crick and Dr. Strickland had explained in detail why aggregate methods were better suited to the individually unpredictable Block 7 wells than

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251 RPS' Direct Presentation, Slide 42.

252 *Ibid.*, Slides 32-39.

253 Tr. Q. (4) 1068: 5 (Strickland); see also Crick's Direction Presentation, Slide 3.

254 RPS' Direct Presentation, Slide 33.

255 Cl. PHB Q., paragraph 38.

256 Tr. Q. (4) 1188:11-1189:2 (RPS); RPS' Direct Presentation, Slide 42.

well-by-well forecasts.[257] Petroamazonas' own reserves evaluator, Ryder Scott, had used type curves in its forecasting for these Blocks, just as Mr. Crick had. Mr. Crick's method produced an excellent match to actual production from the wells it was designed to predict.

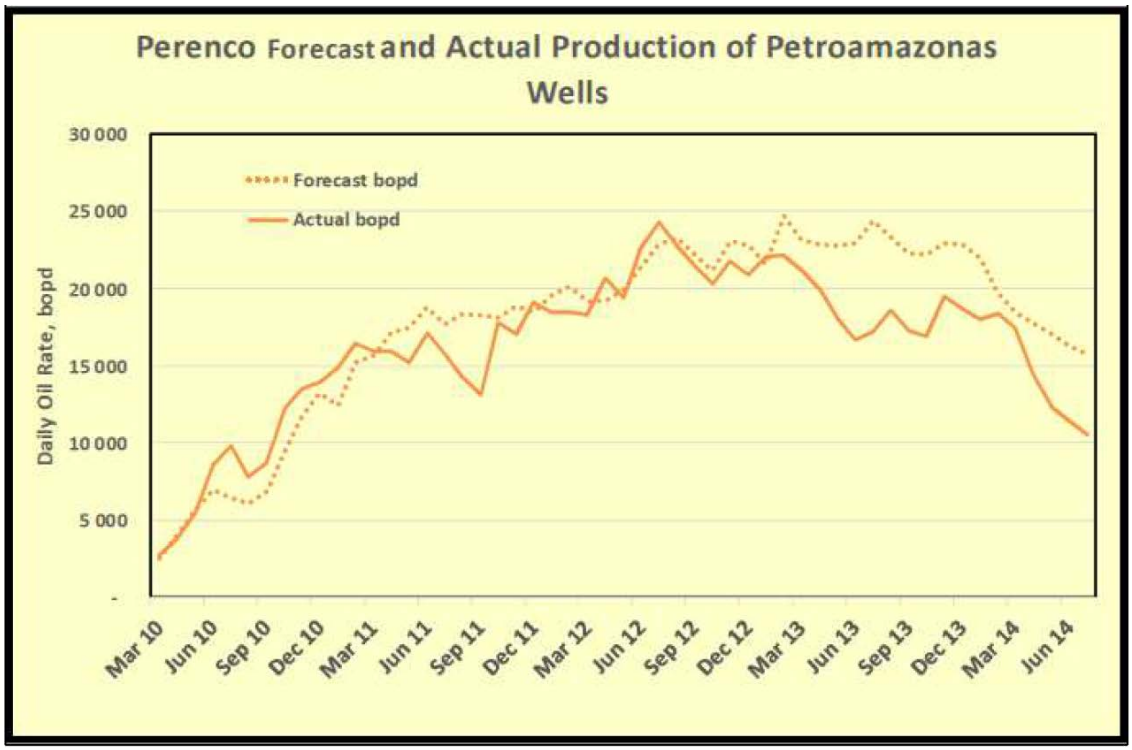

Figure 12: Comparison of forecasted and actual well performance for the new Petroamazonas wells. JC WS II, Fig. 39.

257 Crick WS III, paragraphs 14-27; Strickland ER II, Section II.

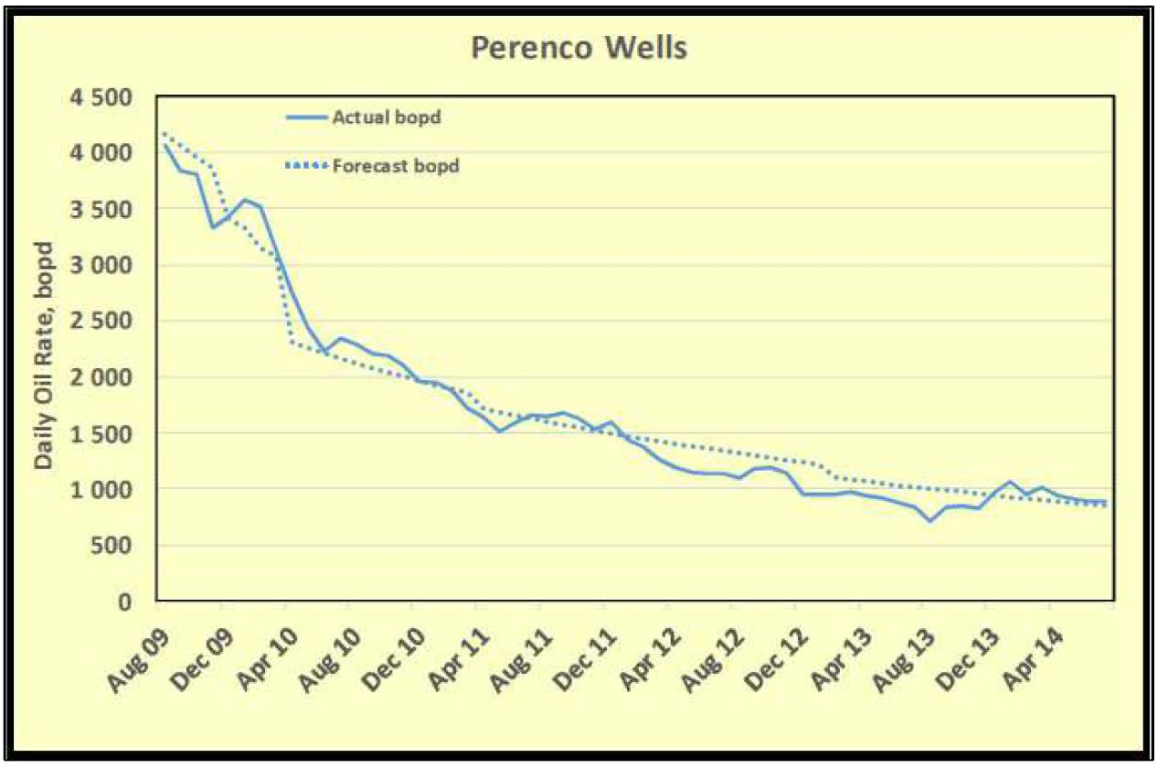

Figure 13: Comparison of forecasted and actual well performance for the Perenco-operated wells. JC WS II, Fig. 41.

250. Despite the earlier criticisms, RPS was forced to admit on cross-examination that Mr. Crick's methods in fact produced more accurate results (2%) than RPS' own results (8%).[258] RPS' only criticism was that Mr. Crick should have begun his forecast not in August 2009, but rather at the very beginning of each well's productive life.[259] In other words, the method's "good match" —its proven reliability in forecasting the future— should be disregarded because it fails to accurately forecast the *past*. Yet as RPS readily agreed, the point of '*decline-curve analysis*' is "to predict the future."[260] RPS had itself not provided a forecast that ran from the start of production of every well; rather, much like Mr. Crick, RPS has chosen a particular point in history (in RPS' case, October 2007) as the start of its forecast and then generated a prediction from that point forward.

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258 Tr. Q. (4) 1179:20-1180:7 (RPS).

259 *See* Tr. Q. (4) 1173:20-1174:5 (RPS).

260 Tr. Q. (4) 1175:17-1176:2 (RPS).

251. RPS did not deny that Dr. Strickland's independent forecast for the existing Block 7 wells, which coincided closely with Mr. Crick's numbers, were reliable and accurate.

(iv) The Tribunal's decision

252. In the Tribunal's view, it is a given that the Consortium's thinking would have been dominated by the looming contract expiry. The Tribunal believes that the sharply rising price of oil leading up to October 2007 would have induced Perenco to seek to drill as many wells as were economically possible in the Oso field in the time remaining in that Contract. According to Mr. Crick, in the absence of a contract extension, Perenco would have stopped drilling in Block 7 in August of 2009 in order to ensure an adequate payback on the new wells.[261] Mr. Crick estimates that Perenco could have drilled 24 wells per year in Block 7. The Tribunal agrees and accepts Mr. Crick's production profiles.

253. The Tribunal is satisfied that in the 'but for' scenario commencing October 2007, to the extent that it would have engaged in new drilling, Perenco would have concentrated on the more predictable and technically less challenging Oso field rather than the riskier and more expensive waterflooding that Mr. Crick proposed for the Lobo and Coca-Payamino fields. It notes that Mr. Crick himself stated in his second Witness Statement that: "Lobo is one of the two fields, the other being the Coca-Payamino Unified Field, where, *in the event of an extension to the Block 7 contract*, Perenco was prepared to invest in further development using water injection."[262] The Tribunal takes from this statement that drilling in the Coca-Payamino Unified Field would not have occurred unless a contract extension was granted and, in any event, the statement accords with the Tribunal's own sense of the evidence overall.

254. Therefore, the Tribunal believes that the drilling that would have occurred in Block 7 'but for' Decree 662 would more likely have taken place in the Oso field only.

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261 Crick WS II, paragraph 147; Tr. Q. (3) 627:10-22 (Crick).

262 Crick WS II, paragraph 203. [Emphasis added.]

(v) Conclusion on the estimation of how many Block 7 wells would have been drilled up to August 2009

255. In the Tribunal's view, the Consortium would have drilled four wells by January 2008 and 19 wells from February 2008 to August 2009. It has therefore used this number and timing of wells in its estimate of the damages suffered by Perenco up to the date of the expropriation.

(c) Block 21 'but for' drilling programme up to caducidad

256. As noted above, the valuation of this Block is a two-step process. The first step is to value the future cash flows resulting from Decree 662 as of 4 October 2007 (calculated on the assumed basis that the Contract would operate until their date of expiry). The second step requires an estimation of lost future cash flows performed as of 20 July 2010 for Block 21, 20 July 2010 being the date of the declaration of *caducidad* which took away the remaining lifespan of the Participation Contract.

257. As discussed previously, the second estimate is performed on a "clean sheet" basis. That is, instead of considering Decree 662's "price-depressing" effect on the value of the assets through to the date of the Contract's expiry, to use Perenco's words, the initial estimated lost cash flows for Block 21 will be cut off as of the date of the second valuation, and damages awarded for that period, whereupon a fresh valuation will be performed based on the conditions prevailing in the market as of the day before the declaration of *caducidad* was issued, and a second award of damages will be made for the loss of the Contract's remaining life, based upon the market conditions and the operator's assumed expectations in the 'but for' world of July 2010.

(i) Perenco's Position

258. Perenco points out that at the time of Decree 662's implementation in October 2007, it was only one-third of the way through its Block 21 operatorship, with nearly 14 years left before the Contract's expiry in June 2021. Mr. Crick's 'but for' development programme therefore addressed this lengthy period of time left in the Contract's life. Of the 24 wells estimated, 21 would be infill wells drilled in the central, developed part of the Yuralpa field containing an oil column of at least 90 feet, and the remaining three wells would be located outside of

this area.[263] In Mr. Crick's opinion, infill wells would have been recommended because of the water coning mechanism. Perenco noted that Ecuador's experts, RPS, accepted that infill drilling would indeed lead to new reserves. Half of RPS' own proposed wells were clearly infill.[264]

259. Perenco pointed that in contrast to Mr. Crick's approach, RPS, who had previously claimed in the *Burlington* case that "additional drilling was not justified in Yuralpa field at all because the field was fully developed [in 2007]"[265], had changed its mind in the present proceeding and it now proposed a limited six-well programme.[266] Perenco noted that even its minimum investment commitment included in its 2008 negotiations with Ecuador *after* Decree 662 was promulgated, which contemplated operations on much less favourable economic terms than those contained in the Participation Contract, included seven Yuralpa wells.[267]

260. Dr. Strickland evaluated Mr. Crick's forecast as well as RPS's forecasted performance of the six new Yuralpa wells that it opined would have been drilled. He concluded that both programmes were attainable and the question was which was more reasonable. In his opinion, Mr. Crick's development plan was more reasonable in terms of the volumes forecasted and more reflective of what a prudent operator seeking to maximise its production would do, while RPS failed to explain why a prudent operator would cease drilling after six successful wells in such a large field.[268]

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263 Mr. Crick assumes it will begin in January 2008, instead of July 2008 as proposed in the September 2007 BCM, absent Ecuador's coercive conduct, earlier in particular given the rise in oil prices at that time. The difference in date only causes an overall reduction of 2% in Mr. Crick's numbers. Mr. Crick has provided revised profiles that use the July 2008 start date for new Yuralpa drilling. This adds a layer of conservatism to Mr. Crick's production forecast. Professor Kalt has in turn used Mr. Crick's revised profiles in his updated damages calculation.

264 Cl. Rep. Q., paragraph 75; Crick WS III, paragraphs 88 – 90 and Figure 9.

265 CE-335, paragraph 144.

266 RPS ER IV, paragraph 167.

267 Cl. Rep. Q., paragraph 69.

268 Strickland ER II, paragraph 46.

261. Dr. Strickland had opined that the critical characteristics of the Main Hollín reservoir affecting its ability to produce oil were:[269]

1. Amount of Oil: There was a large amount of oil in place in the Main Hollín. Since only a low percentage had been recovered to date, the ultimate recovery was likely to be even greater than Mr. Crick predicted. In Dr. Strickland's opinion, if oil prices were high enough, even more oil could be recovered than that forecasted by Mr. Crick.
2. Geology and Depositional Environment: In the Yuralpa field, the vast majority of the oil was found in the upper level of the Main Hollín reservoir, which consists of braided stream channels. The braided stream channels of the Main Hollín had a porosity of 20-25%, which was considered excellent for oil recovery. The braided stream channels also had high permeability. Porosity and permeability were two critical characteristics because they dictate whether oil was capable of moving through the reservoir to the well bore.
3. Water Drive: Yuralpa was a "bottom water drive reservoir." As oil was produced, water replenishes the reservoir pores, resulting in a relatively constant pressure of 3,300 psi. The amount of water produced from a well in a water drive reservoir would increase over time as the invading water reached the well. Typically, the recovery of oil-in-place in water drive reservoirs was high.
4. Viscous Oil: The oil in the Main Hollín was relatively heavy and viscous, which made it easy for the underlying water from the aquifer to break through the oil if pulled upward towards the low-pressure area around well perforations. This would lead to the creation of "water cones."
5. Presence of Shales: Shales, which are a type of low permeability, non-productive rock that impede the movement of fluids, were randomly distributed throughout the Main Hollín. The logs from the Main Hollín confirmed the presence of shales in a number of well bores in Yuralpa and Oso. However, the location and extent of shales could not be accurately predicted in the area between wells based on information from existing wells.

262. Perenco argued further that RPS wrongly rested its entire development plan for Block 21 on a proposal made at a single Consortium Budget Committee Meeting (BCM) held in September 2007. It was unreasonable to assume that the Consortium would have proposed and approved a full development plan for the 14 years remaining on the Block 21 Contract. Further, RPS' six proposed wells would produce more than one million barrels each. With

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269 Strickland ER I, paragraph 15.

such productive wells forecasted, it was irrational to assume that the operator would be content to take no further action in the ensuing years.

263. The Quantum Hearing testimony made clear that Perenco's 'but for' infill wells in Yuralpa would produce new reserves. As Dr. Strickland demonstrated in his presentation, RPS' own model disproved RPS' longstanding denial of water coning and its contention that "there are no areas available that would be a good target for infill drilling."[270] In fact, the case for infill wells was even better than what RPS's model had showed: correcting RPS's apparent error in its modeling and using the appropriate 40-acre spacing between existing wells, the simulated infill wells produce even more oil.[271]

264. Hence, Perenco argued that Dr. Gorell's "puzzling refusal" to call a "conical shape" a "cone" notwithstanding[272], there was no longer any question that infill drilling between the existing wells' water cones would be productive. In fact, RPS explicitly "agreed[d] that you will produce oil [from the infill wells] ."[273] The only remaining debate concerned not oil production, but the associated water production[274], with RPS claiming for the first time in its report filed with the Rejoinder that the water production associated with Mr. Crick's wells would substantially exceed the 120,000 barrels of water per day (bwpd) limit imposed by Mr. Crick.[275]

265. Prior to the Quantum Hearing, Perenco had criticised RPS for failing to run the Yuralpa simulation model, which it used to generate its Yuralpa forecasts, in a reasonable way.[276]

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270 Cl. PHB Q., paragraph 41 referring to RPS ER V, App O, paragraph 27. Tr. Q. (4) 1027:13-14 (Strickland); Strickland Presentation at 9-23; see Strickland Model Displays submitted 15 December 2015.

271 Tr. Q. (4) 1042:19-1043:20 (Strickland). The Tribunal observes that Mr. Crick and Dr. Strickland both proposed 40 acres in the expert reports; however, Dr. Strickland talked about 50 acres during his direct presentation (working off of RPS' model) and also reproduced RPS' 70-acre spacing. He opined that more oil would be produced from the 70-acre spacing: Tr. Q. (4) 1043:4-8: "If you want 70-acres, then 70-acres per well is a square that's 1746 feet per side. Well, that's a bigger spacing. If you want a bigger spacing, that's going to be more oil in place, that's going to increase recovery, delay the water breakthrough."

272 Tr. Q. (4) 1223:22-1224:2 (RPS).

273 Tr. Q. (4) 1103:16-21 (RPS).

274 Tr. Q. (4) 1103:122-1104:2 (RPS).

275 Tr. Q. (4) 1113:4-1115:2(RPS); RPS ER V, paragraphs 205-211.

276 Cl. Rep. Q., paragraphs 103-104.

For example, RPS did not assume the behavior of a rational operator who would have allowed the field's fluid offtake rate (the amount of fluid produced through operations) to increase over time.[277] RPS's own results indicated that even a modest increase in fieldwide water production significantly increased oil production.[278] RPS nevertheless chose to keep fluid offtake levels low, with no explanation as to why Perenco would behave so irrationally.[279]

266. As Mr. Crick explained, in a water-drive reservoir such as the Yuralpa Hollín, where a powerful aquifer underlies all the oil and could be expected to encroach into the wells, increasing water-handling capacity was required to maximise the fields' productivity.[280] Put simply, to produce greater volumes of oil, the operator must be prepared to produce and handle ever-greater volumes of water. As RPS was aware, Mr. Crick used a field-wide limit of 120,000 barrels per day.[281] Yet RPS said nothing about Mr. Crick's proposed limit and provided no explanation for its decision to restrain its own forecast with much lower limits. In fact, Mr. Crick demonstrated that based on the latest data, his initial water estimate was actually pessimistic and the water production from his proposed new wells would be entirely manageable.[282] RPS' only technical objection (that the water production associated with Mr. Crick's wells would substantially exceed the 120,000 barrels of water per day limit imposed by Mr. Crick) was thus invalid. Hence, RPS' only technical reason for opposing Mr. Crick's Yuralpa development plan is invalid.

267. Perenco argued further that in contrast to Mr. Crick's plan, the Quantum Hearing revealed that RPS' own water production estimate was premised on a fundamental error: trusting the full-field Yuralpa model to make an accurate forecast of water production. Dr. Strickland showed that this is what RPS did. The flaw in that approach was that the model

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277 Crick WS III, paragraphs 56-63.

278 See RPS ER IV, Appendix E, Tables 2-3 and 5-6; Crick WS III, paragraphs 57-59.

279 Crick WS III, paragraphs 60, 108.

280 Crick WS III, paragraphs 56, 63; Crick WS II, paragraphs 47-55, 77-81, 166, 197-200; see Strickland ER II, paragraph 36.

281 Crick WS III, paragraph 61.

282 Tr. Q. (3) 642:22 – 644:22; 711:13 – 712:9 (Crick); Crick's Direct Presentation, Slides 27-33.

contained no water-blocking shales beneath the simulated infill wells (it was therefore a 'worst case' scenario). Such a model would obviously forecast abundant water production, when in reality the presence of shales would substantially *reduce* water production. Dr. Strickland explained that full field models in a bottom waterdrive reservoir where there are shales that block water production is not a good forecasting tool.[283] Actual data proves that the model is empirically wrong: it predicts a much higher water-oil ratio (WOR) than has been actually observed in the field.[284]

268. Perenco also contended that RPS misused a graph displaying Yuralpa's WOR as a function of cumulative production. RPS made a water production forecast for both existing and new wells using a WOR graph that records the behavior of existing Yuralpa wells only.[285] This made no sense, in that it assumed that the new wells would add no reserves, which is indisputably false.

269. Finally, in addition to the vindication of Mr. Crick's Yuralpa development plan as a technical matter, the evidence also disproved Ecuador's contention that the outlook in Yuralpa was so "bleak" and "disappointing" that Perenco would simply have given up on the field.[286] To the contrary, somewhat lower than expected per-well recoveries compelled Perenco to drill more wells, even marginally profitable ones, in order to recover this investment.[287] The wells were still turning a profit, and as Mr. Caldwell of Brattle conceded, if Perenco had a reason to drill even marginal wells, there is no economic reason not to do just that.[288] Hence, the 2007 Yuralpa Study's six new wells can only be a minimum, not a maximum —a plan for the next set of work, not the full set of work.[289]

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283 Tr. Q. (4) 1048:16-22 (Strickland); see also Tr. Q. (4) 1064:21-1065:11 (Strickland) (discussing water production in RPS's four-well model from its Fifth Report).

284 Tr. Q. (3) 641:18-642:21 (Crick); Crick's Direct Presentation, Slide 26; Tr. Q. (4) 1049:14-19 (Strickland).

285 Tr. Q. (4) 1113:7-1115:2 (RPS); RPS' Direct Presentation, Slide 19; RPS ER V, paragraph 210, Figure 2.

286 See *e.g.* Tr. Q. (1) 242:18-243:1 (Respondent's Opening); Tr. Q. (2) 385:10-11, 393:12-15 (Combe); Tr. Q. (2) 489:7-490:10 (d'Argentré); Tr. Q. (3) 675:7-11 (Crick).

287 Tr. Q. (2) 418:13-419:1, 420:4-14, 425:14-426:9 (Combe); Tr. Q. (2) 490:7-20 (d'Argentré).

288 Tr. Q. (5) 1582:15-1583:14 (Brattle).

289 *Ibid.*

The 2007 Study itself discusses "new infill wells" and lists further analysis to be completed in support of such wells.[290]

270. Dr. Strickland also reviewed Mr. Crick's forecasted production volumes, pursuant to his drilling plan, against a series of tests as well as the actual drilling plans executed by Petroamazonas. He also considered the critical characteristics of the Main Hollín affecting its ability to produce oil as set out at paragraph 261 above.[291] Mr. Crick forecasted that the existing wells would recover 52.1 MMStb[292] of oil and the new forecasted wells 11.3 MMStb.[293]

271. Dr. Strickland noted that the presence of water coning, and the effects of good water-blocking shales, had been documented in Yuralpa.[294] Due to the unpredictability of the location and extent of shales, it was difficult to extrapolate individual well performance in the Main Hollín so as to predict reservoir production with reasonable confidence since great differences existed between wells; however, it was easier to determine what the next group of wells would likely produce.[295]

272. Dr. Strickland also confirmed that additional oil between wells could be recovered by infill drilling, *i.e.* placement of new wells, as suggested by Mr. Crick in his development plan for Yuralpa.[296] Such additional wells would be needed if the operator was to capture the significant amounts of oil remaining in the Yuralpa field.[297]

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290 Crick WS II, Appendix E, p. 3

291 Strickland ER I, paragraph 15.

292 Crick WS II, paragraph 121, noted that that the production from existing wells in Block 21 drilled until January 2008 was 20.19 million barrels. The additional production from the original Perenco wells between that date and contract end in June 2021 would be influenced by the new wells, estimated at 31.84 million barrels, giving a total recovery from the original Perenco wells of 52.03 million (20.19 from 2004 to January 2008 + 31.84 from February 2008 to June 2021).

293 Crick WS III, Figure 1.

294 Strickland ER I, paragraph 30.

295 *Ibid.*, paragraph 34.

296 *Ibid.*, paragraphs 35-36.

297 *Ibid.*, paragraph 37.

273. Dr. Strickland tested Mr. Crick's forecasts using four types of '*production performance analysis*'/ '*decline curve analysis*':

1. Rate *vs* Time
2. Type Curve
3. Rate *vs* Cumulative
4. Water to Oil Ratio *vs* Cumulative[298]

274. He found that Mr. Crick's application of the type-curve analysis was consistent with industry methods of forecasting future production for fields where individual wells were not well-behaved (*i.e.*, where the plotted production data for each do not follow a predictable trend).[299] He confirmed that the data from these wells were not well-behaved on a well-by-well basis.[300] However, the data was well-behaved on a group or field-wide prediction basis. Dr. Strickland applied the four techniques to a field-wide analysis of all wells as of August 2009 and then to each group of wells according to the year that they were drilled. Comparing Mr. Crick's calculation to his independently calculated estimates, Dr. Strickland found that Mr. Crick's calculations fell within his independent calculations and therefore he was confident that Mr. Crick reasonably and validly calculated the reserves and EUR of existing wells in the Yuralpa field.[301]

275. For the new wells that Mr. Crick forecasted in Block 21, Dr. Strickland applied a different methodology because historical information did not exist. He found Mr. Crick's forecasting approach to be consistent with industry practice.[302] On the basis that wells drilled later in time would have lower initial rates and per-well EURs, Dr. Strickland plotted the average

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298 *Ibid.*, paragraph 42. Dr. Strickland explained that this technique plots the water-to-oil ratio ("WOR") on the y-axis against the cumulative oil production on the x-axis. This type of plot is useful for wells that produce a great deal of water as compared to oil, as is the case with the wells producing from the Main Hollin. Only focusing on oil rates may give a pessimistic estimate of reserves in such circumstances. The common economic cut-off is a WOR of 49, meaning that 49 barrels of water are produced with each barrel of oil. A WOR of 49 is equivalent to a 98% water cut.

299 *Ibid.*, paragraph 49; he explains definition of well-behaved wells at paragraph 44.

300 *Ibid.*, paragraph 50.

301 *Ibid.*, paragraph 51.

302 *Ibid.*, paragraph 68.

per-well EUR for the same group of wells and found a well-behaved trend, providing a prediction of the average per-well EUR for the next group of wells drilled in Yuralpa.[303] He confirmed that Mr. Crick's forecasts were reasonable, and likely conservative.[304] Dr. Strickland's numbers were:[305]

Block 21 Yuralpa
Existing Wells Forecast
Expected Ultimate Recovery (MMStb)

Well Group	Wells Included	Forecast Method				
		Rate Time MMStb	Rate Cum MMStb	WOR Cum MMStb	Type Curve MMStb	Average of 4 Methods
1	Drill 2004	12.5	12.4	13.3	14.5	
2	Drill 2005	20.2	20.0	23.7	23.2	
3	Drill 2006-7	15.7	15.6	18.3	18.3	
	Sum of Groups 1, 2 & 3	48.4	48.0	55.3	56.0	51.9
4	All Perenco Operated	47.9	48.0	62.6	53.3	53.0
Analysis of John Crick					52.1	

276. Using Perenco's history-matched numerical model, developed in 2007 and later updated,[306] Dr. Strickland confirmed that there was enough oil remaining in un-swept locations to drill the 24 wells forecasted by Mr. Crick.[307]

277. Although Mr. Crick's correlation was acknowledged to be imperfect[308], Perenco contended that Mr. Crick's correlation was a useful and conservative basis for forecasting the new wells' production. Decline curve analysis was a reliable forecasting tool where, as here, there is every reason to believe that Perenco would continue to undertake the necessary work and investments – just as Petroamazonas has in fact done.[309] Although RPS had argued in its Fifth Report that Mr. Crick used an improper averaging technique in creating

303 *Ibid.*, paragraphs 68-69.
304 *Ibid.*, paragraph 71.
305 Strickland ER II, paragraph 41.
306 Strickland Reference 5.
307 Strickland ER I, paragraph 76.
308 Tr. Q. (3) 636:2-6, 658:20-660:8 (Crick).
309 Cl. PHB Q., paragraph 46.

his type curves, Mr. Crick argued that this was not true and RPS made no attempt to revive this point.[310]

278. Perenco asserted further that RPS argued for adoption of a 17% decline rate sourced from Petroamazonas' Block 21 contract with YPF that RPS had itself explicitly rejected in the *Burlington* proceeding. Having conceded that this rate ought never to have been used, RPS attempted to reach the same steep decline rate by extrapolating the field's decline over a period that included the negative impact of Decree 662.[311] On cross-examination, Dr. Gorell agreed that any extrapolation should be sensitive to the import of historical events.[312]

279. Perenco submitted further that Mr. Crick's forecasts have been verified by other independent sources, including later estimates from Petroamazonas, Ryder Scott and Dr. Strickland. RPS on the other hand offered no criticism at all of Dr. Strickland's Yuralpa predictions and Ecuador did not cross-examine Dr. Strickland on his forecasting methods or results.[313]

280. Based on Mr. Crick's technical work, as reviewed by Dr. Strickland, Professor Kalt then estimated the value of Block 21 foregone by Perenco as a result of Ecuador's Treaty and contractual breaches. He calculated that Perenco's damages arising from Block 21 suffered as a result of the breaches amounted to $501.5 million if valued on an *ex ante* basis[314] and $651.6 million, if valued on an *ex post* basis.[315]

(ii) Ecuador's Position

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310 Tr. Q. (3) 637:9-15 (Crick).

311 Cl. PHB Q., paragraph 52 referring to Tr. Q. (4) 1209:8-10 (RPS) (discussing RPS ER V, Appendix Q, Figure 3).

312 Cl. PHB Q., paragraph 52; Tr. Q. (4) 1209:11-1212:8 (RPS).

313 Cl. PHB Q., paragraph 53.

314 Kalt ER IV, Exhibit JK-64, PSC Extension 2010 scenario.

315 *Id.*

281. In Ecuador's view, the Consortium would have only drilled up to six, not 24, new wells at Yuralpa.

282. Ecuador observed that it was not in dispute that the Yuralpa field was Perenco's first greenfield project and that its development was strewn with unforeseen challenges and unexpectedly poor results. As admitted by Mr. Combe, following the sudden and inexplicable loss of its two best producers in 2004, the field never again met the Consortium's 20,000 barrels of oil per day 'ship-or-pay' commitment[316], notwithstanding investments substantially higher than originally expected.[317] Subsequent consecutive drilling campaigns also yielded disappointing results.

283. Against this backdrop, Perenco halted drilling in February 2007 (months before Decree 662 was promulgated) and, in an attempt to address the significant challenges encountered at Yuralpa, commissioned a state-of-the-art full-field study. The preliminary results of this study were presented at the September 2007 BCM. This and a slightly refined and final version of the Yuralpa Simulation Study issued by Perenco in June 2008 identified two unswept areas in which the existing wells alone would not have drained the reservoir by 2021. As a result, the September 2007 BCM presentation set out a preliminary programme of between six and eight new wells in the main and south-eastern fringe areas of the field, to be drilled starting in July 2008. This was later reduced to between five and seven wells in the subsequent Simulation Study, in order to effectively sweep the reservoir.[318]

284. Accordingly, RPS concluded that six new wells would have been drilled at Yuralpa from July 2008 onwards but for Decree 662: two in the main area of the field, three in the south-eastern fringe and one re-drill towards the south.[319] Ecuador rejected the contention that RPS had shifted positions between the *Burlington* and *Perenco* arbitrations; the two

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316 Tr. Q. (2) 383: 22-384:4 and Tr. Q. (2) 390:15-391:1 (Combe); see also E-155, Chart analysing oil production data by Block, field and reservoir of Blocks 7 and 21, p. 5.

317 Tr. Q. (2) 386:14-20 (Combe); see also Tr. Q. (2) 330:2-10; Tr. Q. (2) 419:2-8 (Combe).

318 Crick WS II, Appendix E, Yuralpa Field Study, pp. 2, 32, 34.

319 Crick WS II, Appendix E, Yuralpa Field Study, Figure 161; see also Tr. Q. (4) 1097:21-1098:2 (RPS).

tribunals had made different findings and hence different perspectives needed to be adopted as a result.[320]

285. Perenco's purported 24-well drilling programme, which would have commenced in July 2008, was at odds with Perenco's September 2007 BCM presentation and the Yuralpa Simulation Study issued in June 2008, which contemplated drilling between five and (no more than) seven horizontal wells so as to effectively sweep the two areas which would have been otherwise left undrained by 2021.

286. Neither the Yuralpa Simulation Study nor any contemporaneous document implied, let alone demonstrated, that there was any significant issue with respect to how Perenco's Geoscience department carried out the Study or constructed its state-of-the-art model. Nor were the conclusions and recommendations criticised or in any way impugned prior to Mr. Crick's testimony. The Study simply did not envisage the need for, or indeed identify the benefit of, proceeding with an extensive infill drilling campaign in the main area of the Yuralpa field and instead focused on further development of the fringe area, where the oil column thickness was inferior to 90 feet.[321]

287. Yet, Mr. Crick's evidence was that the Consortium would have set aside the conclusions and recommendations from this in-depth study and instead embark upon a spur-of-the-moment 24 vertical well campaign, commencing with 21 infill wells in the main area of the field. Mr. Crick's justification was because he wanted to do vertical wells.[322]

288. Mr. Crick's extensive infill drilling programme was premised on the assumption that water coning was a pervasive occurrence at Yuralpa.[323] In Ecuador's view, this was not supported by any document on the record and infill drilling was inconsistent with the recommendations of the Yuralpa Study. RPS demonstrated that, consistent with the Kerr McGee report[324], water movement was actually far more complex in the Main Hollín

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320 Resp. Rep. PHB Q., paragraph 67; RPS ER V, Section 2.4; RPS ER V, Section 2.4.

321 Resp. Rep. PHB Q., paragraph 69.

322 Resp. Rep. PHB Q., paragraph 68; Tr. Q. (3) 623:9-18 (Crick).

323 Tr. Q. (3) 634:19-635:2 (Crick).

324 Crick WS III, Appendix G, p. 15.

reservoir. As shown in RPS's 4-well sample simulations, each well drilled gave rise to extensive lateral water movement, which extended outward with time and, by interacting with the water movement caused by neighbouring wells, eliminated any "infill" drilling targets.

289. Neither Mr. Crick nor Dr. Strickland levied any material criticism against RPS' simulation runs or their ultimate conclusion. Dr. Strickland did not outright reject the notion of extensive lateral water movement. Instead, he sought to downplay its impact by purporting to show that even in RPS' 4-well water encroachment model, enough oil remained trapped between wells so as to warrant drilling the fifth "infill" well. This failed for two reasons:

1. Dr. Strickland focused on representations of the 4-well sample at 12, 19 and 25 months into production. However, this overlooked the fact that the actual Yuralpa wells were much older than that. On average, the wells drilled in this area would have been producing between 33 months and 57 months between the commencement and end of Mr. Crick's drilling campaign. These wells would have caused far more extensive water encroachment and left far less recoverable oil between them.

2. The recovery of any such incremental oil, would be accompanied by the production of large amounts of water.[325] The aggregate water production of 24 such wells would very rapidly surpass the handling capacity of 45,000 bwpd of the field in 2008, thus requiring substantial investment towards an upgrade. Dr. Strickland did not seek to quantify the associated water production.[326]

290. Mr. Crick's development plan and his own run of the Yuralpa model would yield far more water than his assumed upgraded handling capacity of 120,000 bwpd. In particular, according to Mr. Crick's development plan, the water production was expected to increase steadily up to 180,000 bwpd in 2021. As a remedy to such increase, Mr. Crick provided for three water shutoff workovers (WSOs) to be carried out per year, starting in 2015. However, as shown by RPS, such WSOs could not achieve the massive reduction in water production that they were credited with.[327] In addition, Mr. Crick's own run of the Yuralpa model also yielded water production figures far higher than his stated 120,000 bwpd, which

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325 Tr. Q. (4) 1104:3-1105:4 (RPS).

326 Resp. PHB Q., paragraph 100.

327 RPS ER V, paragraphs 213-216.

he then sought to cap through over 100 automatic WSOs. As demonstrated by RPS and conceded by Mr. Crick, however, such operations were unrealistic and costly.

291. RPS also took issue with Mr. Crick's observation that the simulator over-predicted water production. This was true so long as the field operations remained unchanged, but it was not a valid assumption to make if 24 new wells were put into production in the reservoir and the way in which the wells were operated was significantly changed. This meant that a reasonable proportional cutback of liquid production would inevitably require a significant reduction in the total amount of oil produced, something which was ignored by Mr. Crick.[328] Moreover, in response to Perenco's argument that since "the model contains no water-blocking shales beneath the simulated infill wells" RPS was using a "worst-case scenario" forecasting tool[329], it is not possible to accurately predict the location of shales.[330] This meant that Mr. Crick's 24 new wells were just as likely *not* to encounter shales as they were drilled. Even if the shales could be accounted for prior to any drilling, it was not true that they would have an effect on cumulative water production. Ecuador asserted that such shales would, at best, laterally deviate the otherwise vertical course of water,[331] which would increase the amount of mobile water in the field and consequently the amount of water produced by another well.[332]

292. RPS further asserted that in addition to not imposing a field wide limit on the total water production, Mr. Crick also changed how the simulation controls the wells by simultaneously changing well minimum production rates and workover procedures, "all in manners which tend to increase oil production."[333] RPS found these to be "outrageously optimistic."[334]

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328 *Ibid.*, paragraph 208.

329 Cl. PHB Q., paragraph 44.

330 Tr. Q. (4) 1023:3-8, 1045:13-17 (Strickland); Tr. Q. (3) 635:5-8 (Crick).

331 Resp. Rep. PHB Q., paragraph 71 referring to Strickland ER I, Figure 1 and Figure 5; Tr. Q. (3) 635:8-11 (Crick).

332 Resp. Rep. PHB Q., paragraph 71.

333 RPS ER V, paragraph 209.

334 *Id.*

293. Ecuador also criticised Mr. Crick's type-curve forecasting methodology[335] asserting that it can be very imprecise, differing from reality by as much as 45%, as acknowledged by Mr. Crick.[336] The initial rate of the wells was incorrectly determined; Mr. Crick purported to derive this rate from an alleged correction between the actual initial rates of 27 Perenco wells and 11 wells drilled by Petroamazonas, but Mr. Crick conceded at the Quantum Hearing that this was not a reliable correction[337]: its 0.25 coefficient was far below the 0.6 required to find a valid statistical correlation. Moreover, the well data Mr. Crick relied on to derive this "non-correlation" was selected in an inconsistent manner because he had chosen to exclude eight wells out of a total of 35 (23% of the available data) on the ground that he considered them to be "outliers."[338] As RPS pointed out, it is statistically unsound to exclude 23% of the data.[339]

294. Mr. Crick's attempt to validate his method by reference to "the initial rate from the Petroamazonas wells to predict the performance of the Petroamazonas wells" is plainly unavailing, as it is achieved through a circular (and thus technically incorrect) process.

295. Despite it being "readily acknowledged" to be flawed[340], Perenco sought to re-characterise Mr. Crick's initial rate correlation as a useful and conservative basis for forecasting but Ecuador argued that this relied on statements that Mr. Crick did not actually make at the Quantum Hearing.[341]

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335 Resp. PHB Q., paragraph 118: Mr. Crick first determines the initial oil rate for his new wells, before applying to these (and to the existing) wells a type-curve calculated at field level. Tr. Q. (3) 628:9-629:19 and Tr. Q. (3) 635:20-636:2 (Crick). See also, Crick WS II, paragraphs 113-115, 183-188.

336 Tr. Q. (3) 655-657:13 (Crick).

337 Tr. Q. (3) 636:3-5, 658:7-660:8 (Crick). See also, RPS' Direct Presentation, p. 11; RPS ER V, paragraphs 175-176.

338 Resp. PHB Q., paragraph 119.

339 Resp. PHB Q., paragraph 119 referring to Tr. Q. (4) 1107:23-1108:15 (RPS). See also, RPS ER V, paragraphs 173-177.

340 Resp. Rep. PHB Q., paragraph 80 referring to Cl. PHB Q., paragraph 50; Tr. Q. (3) 660:2-5 (Crick).

341 Resp. Rep. PHB Q., paragraph 80 referring to Cl. PHB Q., paragraph 50; Tr. Q. (3) 636:18-637:8, 659:19-660-2 (Crick).

296. RPS estimated that the aggregate oil production from Block 21 would have totaled 29.64 MMbo through to contract expiry. Such production would have been derived from both the existing wells (22.83 MMbo) and from the six new wells the Consortium would have drilled but for Decree 662 (6.81 MMbo).[342] RPS' forecast was derived from the Yuralpa simulation model which represented the culmination of a major phase of geomodelling and simulation work carried out by Perenco's own geoscience department. This model was undoubtedly the best and most up-to-date prediction tool available to the Consortium from late 2007 onwards and is therefore, the most appropriate means of forecasting oil production in Block 21.[343]

(iii)The Tribunal's Decision

297. The Tribunal notes that for Block 21, Mr. Crick's plan was that all 24 of his Yuralpa field wells would be drilled in the period commencing January 2008 through to the end of 2009 (assuming two rigs operating, each one taking a month to drill a well[344]) and he projected no additional drilling from the end of 2009 through to contract expiry in 2021, a period of some 11 years. In his third witness statement, he adjusted his commencement date to July 2008.[345] However, he still contemplated all 24 wells being drilled before the declaration of *caducidad* and none being drilled thereafter.

298. His 'but for' drilling programme was thus 'front-end loaded'.

299. The Tribunal has taken note of documentary and oral evidence which showed that:

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342 RPS ER IV, paragraph 150, Table 14.

343 While Perenco sought to depict RPS' reliance on the 2010 updated version of this model as being inconsistent with its *ex ante* approach, the fact remains that RPS was not provided the June 2008 version of the model. The implications of RPS' use of the 2010 update would, in any event, appear to be inconsequential in light of Crick's own testimony that what happened in 2010 was a typical minor adjustment to the model and not a full update incorporating all of the knowledge available at the time. See Crick WS III, paragraphs 53-54.

344 Crick WS II, paragraph 256. Perenco employed such a programme starting in December 2004, where it drilled 28 wells until it halted drilling in order to conduct a field study. RPS ER V, paragraph 143.

345 Crick WS III, paragraph 3.

(1) Block 21 consistently performed below expectations after its first three months of production in 2004.[346]

(2) This led to Perenco's decision to halt drilling in February 2007, some seven months before Decree 662 came into effect.[347]

(3) Burlington's parent, ConocoPhillips, produced a Latin America Reserves Review in May 2007 which noted that drilling in Yuralpa had been "*currently halted to conduct field study (water production key issue)*" and further that "*disappointing well results in latter part of 2006 reduced development [drilling] opportunities* - Field study currently underway."[348]

(4) The ConocoPhillips Information Memorandum (also of May 2007) stated that "…due to earlier than expected water breakthrough in the latest wells, further drilling has been put on hold pending the completion of a reservoir and completion practices study."[349]

(5) Based on the preliminary study being performed by Perenco, ConocoPhillips at this point anticipated nine wells as "potential targets" (four infill and five offset (*i.e.*, flank) locations, but by the September 2007 Budget Committee Meeting (BCM), the number was reduced to five to seven with fewer interior wells.[350]

(6) Perenco informed the BCM of 26-27 September 2007 that there would be "*no investment [in Block 21]… for first half of 2008.*"[351]

(7) Perenco's "preliminary programme" in September 2007 was that five to seven wells be drilled.

(8) The final report on the field study was distributed only in June 2008, eight months after Decree 662 came into effect.[352]

(9) It is conceded by RPS that the field study identified two unswept areas in Block 21 where oil which would not have been drained by the existing wells.[353]

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346 Tr. Q. (2) 383:3-387:9 (Combe); Tr. Q. (2) 390:18-393:15.

347 Tr. Q. (4) 1053:22-1054:14 (Strickland). E-393, ConocoPhillips Latin America Reserves Review Ecuador, 7 May 2007, p. 13; E-275, Confidential Memorandum, ConocoPhillips, May 2007, p. 44.

348 RPS ER IV, Appendix K, pp. 5 and 13. RPS contended that this shows that the Consortium saw this drilling programme as a "last opportunity" for success. See RPS ER V, paragraph 164.

349 E-275, ConocoPhillips Information Memorandum.

350 RPS ER IV, Appendix H, p. 164.

351 E-387, Budget Committee Meeting Slides, Slide 164.

352 RPS ER V, paragraph 161.

353 RPS ER V, paragraph 54: "In addition, in order to properly reflect the Consortium's perspective, RPS adopted the model developed by Mr. Crick's Perenco colleagues, as referenced by Perenco on 19 December 2014 in Dr. Strickland's First Report. RPS proceeded to use this model in a diligent and prudent manner to investigate

300. The real questions for the Tribunal are: (i) given the Yuralpa field's history, at what pace would drilling have occurred in the 'but for' world; and (ii) what would be the financial impact of the water handling required to exploit the wells in Yuralpa.

301. RPS noted the following points about the Perenco simulation study:

> "Base case reserves were 20.3 MMstb. They were calculated using the wells that existed as of October 2007, and using the fluid production rates at that time.
> Water handling capacity was 45,000 barrels per day.
> Perenco evaluated the potential to increase reserves to 25.7 MMstb by maintaining the current drawdown in the existing wells. This would necessitate increase in water handling to 60,000 barrels per day.
>
> [...]
>
> Perenco evaluated drilling between five and seven wells, which could increase reserves to 32.0 MMstb with the current liquid production rates in existing wells. [...]"[354]

302. Based on the evidence before it, the Tribunal considers that in the 'but for' period following 4 October 2007, the Consortium would have been, on the one hand, incentivised to drill by the rising oil prices experienced in the period leading up to October 2007. On the other hand, the Consortium would have been more conservative than Mr. Crick in committing to an ambitious drilling programme, given the hitherto disappointing performance of Block 21. That said, the general view must be that in the 'but for' world, particularly with a relatively long period of time remaining on the Contract and strong oil prices at the time, the Consortium would have drilled all wells that were technically and economically feasible.

303. In the circumstances, and given Mr. Crick's adjustment in timing, the Tribunal therefore considers that this programme would have commenced no earlier than July 2008.[355]

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the robustness of the Perenco simulation team's findings regarding the two potentially unswept areas of the Main Hollin reservoir in Yuralpa and its recommendation to drill 5 to 7 wells to exploit the opportunity to recover the volumes therein." [footnotes omitted.]

354 RPS ER V, paragraph 151.

355 Mr. Crick initially used a January 2008 start date but later adjusted it to July 2008 which reduced his predicted oil volumes by 2%. See Crick WS III, paragraph 3.

Therefore, when estimating the Yuralpa field's value for the purposes of calculating the effect of Decree 662, there would be no increase in the number of Block 21 wells until mid-2008. As for what would happen thereafter, the Tribunal considers that it would be appropriate to assume that Perenco would have drilled six wells between Decree 662 and the declaration of *caducidad*.

304. The Tribunal considers that the starting point for the analysis is a model based on the drilling programme as contemplated in 2008 (six wells) in the period leading up to *caducidad* and to adjust for an increased number of wells.

E. The impact of *caducidad*'s termination of the balance of Perenco's contractual rights

305. The declaration of *caducidad* terminated the Participation Contracts. This was done only one month before the Block 7 Participation Contract expired. As already noted, the Tribunal has declined to assume a particular contractual model that might have governed the Parties' relationship in relation to Block 7 and has chosen instead to treat this as a compensable loss of opportunity, addressed below.

306. The Tribunal therefore begins by considering the situation in Block 21, which Perenco would have operated for some approximately 11 years had *caducidad* not been declared. This raises Mr. Crick's 'but for' drilling plan for the Yuralpa field.

307. With respect to the 11 remaining years on the Contract and prices prevailing in the period leading up to July 2010, had *caducidad* not been declared, given that there is exploitable oil in Block 21, the Tribunal considers that Perenco would have conducted further drilling, particularly when it is assumed as the Tribunal has decided to assume that as of October 2008, the Participation Contracts would be stabilised at 33%. In the end, the Tribunal has decided to employ a mid-range number of wells from Mr. Crick's scenario. In the Tribunal's view, having regard to industry practices and in particular the desirability of maximising Perenco's returns in Block 21 over a still lengthy period of time as well as the value of accelerating drilling in order to capture as much production as possible, but mindful of the Block's history of watering issues, Perenco would have drilled additional wells after expropriation.

308. Having arrived at this conclusion, the Tribunal is aware of the fact that the *Burlington* tribunal took a different view, namely, that having regard to the situation as of September 2007 before the enactment of Decree 662 only six wells were scheduled to be drilled. This was the number of wells that that tribunal found it was reasonable to assume would it be drilled in the circumstances. The present Tribunal cannot agree with *Burlington*'s heavy reliance on the September 2007 BCM Presentation and accepts Perenco's argument that "budget committee presentations are not development plans and that Perenco had not intended, in the course of a single budget meeting in 2007, to lay out its plans for the 14 years remaining on the Block 21 Contract."[356] The Tribunal believes that given the 14 year time horizon, the Consortium would have been likely to drill more wells so long as it considered that there was commercially exploitable oil.[357]

309. Knowing that Petroamazonas has to some extent validated Mr. Crick's modeling of the Blocks' productive capacity is of some comfort to the Tribunal that it has arrived at a fair and reasonable valuation, but at the end of the day the Tribunal's approach is to: (i) use market conditions prevailing at the time of the taking; (ii) take the common sense commercial view that with 11 years remaining on Block 21's life, Perenco more likely than not would have sought to maximise its efforts to extract as much value from the Block as was reasonably attainable; (iii) Perenco's drilling programme would have been conducted somewhat more conservatively than Mr. Crick's plan, but still would have sought to overcome the Yuralpa field's technical challenges; and (iv) as Perenco gained more knowledge and experience with the field, it would have put that knowledge and experience to commercial benefit in its drilling decisions.

310. The Tribunal considers that 'but for' the declaration of *caducidad*, Perenco would have drilled ten wells (in addition to the six wells drilled before *caducidad*) between 2010 and 2020.

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356 See Perenco's 18 April 2017 comments on the *Burlington* award, p. 4.

357 *Burlington* award, paragraphs 425-426, 436, 449.

311. Having considered the record evidence and the arguments of the Parties, the Tribunal further concludes that the water production levels associated with a 16-well drilling programme would be 120,000 bwpd.[358]

F. Valuation of Perenco's loss of opportunity to operate Block 7

312. The Tribunal turns to the valuation of the loss of opportunity to negotiate an agreement to continue to operate Block 7 until August 2018. As discussed above, this exercise differs from valuing the loss of profits expected under an executed contract and the question is how to value this opportunity.

1. Perenco's Position

313. Perenco submitted (in the alternative to its asserted claim of US$626 million based on the AGIP contract, which the Tribunal has already rejected), Ecuador must pay damages for the value of Perenco's lost opportunity to obtain and benefit from a contract extension. Tribunals are willing to apply the loss of chance doctrine even when the probability is low. Here, Perenco established that an extension would very likely have been granted and at the very least should be compensated for its loss of chance to operate in Block 7 until 2018. Perenco's case was unlike that of the claimants in the *Gemplus* case, where the claimants based their extension claim solely on the ground that the concession gave rise to a legitimate expectation that significant additional revenue could be expected from the second 10-year period.[359] Perenco had established a strong factual basis for the extension and this was not a claim for speculative and uncertain damages.

2. Ecuador's Position

314. In contrast, Ecuador relied on the *Gemplus* award, where that tribunal looked at the language of a similarly drafted clause and concluded that, while the exercise of the State's discretion was not unfettered under municipal law, the claimant's claim for the second

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358 See Section 0) below regarding CAPEX.

359 *Gemplus. v. Mexico*.

period of ten years was far too contingent, uncertain and unproven, lacking any sufficient factual basis for the assessment of compensation under the two applicable BITs. At the relevant date, the concessionaire had no legal right to any extension.[360] Likewise, while Ecuador's discretion was not unfettered under Ecuadorian law, Perenco's claim for an eight-year extension was far too contingent, uncertain and unproven, lacking any sufficient factual basis for the assessment of compensation under the Treaty. At the date of *caducidad*, Perenco had no legal right to an extension.[361]

3. The Tribunal's Decision

315. The Parties have argued over the relevance of the *Gemplus* award, where the concession contract at issue contained a clause that contemplated an extension of the initial 10-year term. The main reason why that tribunal refused the loss of opportunity claim based on the possible renewal of the contract stemmed from the fact that the circumstances which initially threw the motor vehicle registry project into disarray and forced the authorities to intervene to administer the concessionaire occurred at the very outset of the Concession's life.[362] This caused an understandable decline in public confidence in the registry initiative.[363] Hence, the tribunal had little difficulty rejecting that part of the claim.

316. However, although it was facing dramatically different factual circumstances than the present case, and it was then attempting to value a loss resulting from extant contractual

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360 *Gemplus v. Mexico.*, Award, paragraph 12-49.

361 Resp. Rep. PHB Q., paragraph 15.

362 The events in question centered on the arrest of the concessionaire's general manager, Ricardo Cavallo, for his alleged role in the Argentinian "dirty war", his detention in Mexico and subsequent extradition to Spain at the request of a Spanish investigating judge, and his further extradition to Argentina to face war crimes charges in that country. Mr. Cavallo's arrest was quickly followed by the death in murky circumstances of the senior government official, Dr. Raúl Ramos, responsible for the motor vehicle registry project.

363 *Gemplus v. Mexico*, Award, paragraphs 13-96: "As found by the Tribunal, [by the time of termination] the project was by then already severely damaged from earlier events for which the Respondent bears no liability under the BITs; and it remained subject to several commercial, legal and political risks. Moreover, it was the Respondent's own efforts in September 2000 that kept the project even half alive (as regards new vehicles) and not destroyed completely by the twin calamities of August/September 2000, namely the Cavallo incident and the death of Dr. Ramos. But for Dr. Blanco's efforts at the time (at the Secretariat), the Concessionaire would have failed in or soon after September 2000. Moreover this half-life project, by 24 June 2001, was far from the project originally envisaged with its business dependent on the registration of both new and used vehicles."

rights, the *Gemplus* tribunal highlighted two points on 'loss of opportunity' that resonate with the present Tribunal. First, there was "no certainty or realistic expectation of this project's profitability as originally envisaged, but there was nonetheless a reasonable opportunity" and that "opportunity, however small, has a monetary value" at international law.[364] Second, "it would be wrong in principle to deprive or diminish the Claimants of the monetary value of that lost opportunity on lack of evidential grounds when that lack of evidence is directly attributable to the Respondent's own wrongs."[365]

317. This is in line with the present Tribunal's view. The facts are that: (i) Block 7 was a proven field with valuable oil reserves; (ii) there is no question that even with a changed contractual model, Perenco wanted to stay in Ecuador and continue to operate the block; and (iii) there is considerable evidence that the State itself would have preferred Perenco to stay in Ecuador. The Tribunal believes that 'but for' the breaches, the parties more likely than not would have arrived at a solution whereby Perenco would be operating Block 7 under a different contractual regime. But the Tribunal has also found that it cannot engage in the kind of speculation about a specific contractual model which would then be married with Mr. Crick's projections in order to arrive at an amount of damages.

318. Perenco referred the Tribunal to Ripinsky and Williams' Damages in International Investment Law, where the authors observed:

> "Loss of chance can thus be used as a tool allowing the injured party to receive *some* form of compensation for the loss of chance to make profit. In theory, the loss of chance is assessed by reference to the degree of probability of the chance turning out in the plaintiff's favour, although in practice the amount awarded on this account is often discretionary."[366]

319. The authors continue:

> "In some other cases, arbitral tribunals have determined the amount of lost profits in a discretionary manner. Where this lack of numerical support

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364 *Ibid*., paragraphs 13-98.

365 *Ibid.*, paragraphs 13-99.

366 CA-511, Ripinsky, Sergey & Williams, Kevin, *Damages in International Investment Law* (London: British Institute of International and Comparative Law, 2008), pp. 291-292.

> was due to the fact that a tribunal could not estimate the loss of profits with satisfactory precision, such awards may be classified as compensation for the loss of business opportunity. Amounts awarded under this head of damage are likely to be conservative and reflect a tribunal's view of an equitable, reasonable and balanced outcome rather than being a result of a mathematical calculation."[367]

320. The Tribunal observes that the claim here is not to be equated to a lost profits claim based upon a final, executed contract. There is an element of uncertainty that must be taken into consideration.

321. In arriving at its decision, the Tribunal has considered the ILC Articles, particularly Article 36 thereof, and the commentaries (specifically (27) and (32) thereto. Article 36 provides that:

> "1. The State responsible for an internationally wrongful act is under an obligation to compensate for the damage caused thereby, insofar as such damage is not made good by restitution.
> 2. The compensation shall cover any financially assessable damage including loss of profits insofar as it is established."[368]

322. The key point is that financial damage must not only be proximately caused by the unlawful act(s), but that it also be "*assessable*", that is, capable of being assessed. The Tribunal has already observed that it is also alive to the cases' and commentaries' reminder that international courts, tribunals and claims commissions seek to avoid granting "inherently speculative" claims or to put it the other way, seek to determine whether there are "sufficient attributes to be considered a legally protected interest of sufficient certainty to be compensable."[369]

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367 *Ibid*., p. 293.

368 ILC Articles.

369 *Ibid.*, Commentary (27) to Article 34. Particularly the concern expressed about the need to ensure that there is "financially assessable" damage: "Tribunals have been reluctant to provide compensation for claims with inherently speculative elements. When compared with tangible assets, profits (and intangible assets which are income-based) are relatively vulnerable to commercial and political risks, and increasingly so the further into the future projections are made. In cases where lost future profits have been awarded, it has been where an anticipated income stream has attained sufficient attributes to be considered a legally protected interest of sufficient certainty to be compensable. This has normally been achieved by virtue of contractual arrangements or, in some cases, a well-established history of dealings."

323. The circumstances of the present case are unusual. The parties arrived at an 'in principle' negotiated change to their contractual relationship which contemplated the extension of Block 7's term. However, it was Ecuador, and not Perenco, which, due to Burlington's recalcitrance, balked at its implementation. The Tribunal found this refusal was a breach of the Treaty by Ecuador which deprived Perenco of the chance to reach an agreement on extension.[370] Therefore, the Tribunal considers that Perenco is entitled to compensation for the loss of that opportunity.

324. The Tribunal frankly acknowledges that any estimation of the value of the loss of opportunity is an exercise of discretion and therefore it has decided to award a nominal value. In this regard, the Tribunal recalls a comment made by the *Murphy v. Ecuador* tribunal with which the Tribunal agrees:

> "…The applicable international law standard of full reparation, as reflected in the *Chorzów Factory* judgment and Article 31 of the ILC Articles on State Responsibility, does not determine the valuation methodology. Nor does the Treaty. Tribunals enjoy a large margin of appreciation in order to determine how an amount of money may "as far as possible, wipe out all the consequences of the illegal act and re-establish the situation which would, in all probability, have existed if that act had not been committed."[371]

325. Because it is a loss of opportunity to have the contract extended rather than the loss of a fully crystallised legal right to an extension of a contract, the expected cash flows of which could be modelled on a DCF basis, such value must necessarily be significantly lower than the amount claimed by Perenco based on the AGIP contract model applied by Mr. Crick's drilling forecasts for Block 7 through to 2018.

326. In all of the circumstances, the Tribunal holds that an award of US$25 million is appropriate. It cannot but note that the equities tend strongly in favour of the granting of this relief. This however is not a decision *ex aequo et bono*. It is one grounded in law.

G. **Contributory Negligence**

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370 Decision on Liability, paragraphs 622-624.

371 *Murphy v. Ecuador*, paragraph 481.

327. Ecuador's defences on liability and on quantum advanced various arguments to the effect that Perenco was either the author of its own misfortune or otherwise has contributed to the harm in respect of which it now seeks damages. This was prominent in Ecuador's argument during the liability phase that Perenco and Burlington pursued a so-called "*self-expropriation*" strategy in refusing to comply with Law 42 by paying sums into an offshore account, and calculating that they would be better off keeping that money and not operating the Blocks.[372] In the damages phase, Ecuador argued similarly that Perenco contributed to the *coactiva* dispute by refusing to pay Law 42 dues, by threatening suit against persons who purchased the oil at auction, and by suspending operations, knowing that this would force the State to intervene and ultimately could be a ground for *caducidad*.[373]

1. Ecuador's Position

328. Ecuador thus argued that if Perenco was entitled to any damages at all, they ought to be reduced on grounds of contributory negligence. It argued that international law is clear that simple negligence (demonstrating a lack of due care for one's own property or rights[374]) that concurrently contributes to a loss is sufficient to establish contributory negligence.[375]

329. In its view, Perenco's refusal to pay the amounts due under Law 42 was inherently negligent because it compelled Ecuador to react. Ecuador argued that its own alleged breaches of international law were irrelevant to Perenco's contributory negligence because the doctrine of contributory negligence exists in order to reduce the damages from a respondent's breach on account of the claimant's own negligent contribution to the loss it has suffered. Ecuador submitted that if Perenco's excuse for what Ecuador termed "tax evasion"[376] (that is, Ecuador's response was contrary to its international rights) were to be accepted, the doctrine of contributory negligence would have no possible application. Ecuador relied in this regard on the awards in *Goetz*, *Occidental* and *Yukos* where tribunals

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372 Resp. C-Mem. M., paragraph 599; Resp. Rej. M., paragraphs 16, 290-296.

373 Resp. Rej. Q., paragraphs 507-512, 523-525.

374 ILC Articles, Art. 39, comment 5.

375 Resp. Rep. PHB Q., paragraph 105.

376 Resp. PHB Q., paragraph 167.

found the claimants were contributorily negligent for instigating the State's breach and therefore the damages to be awarded were adjusted downward.[377]

330. In addition, Ecuador contended, Perenco was negligent, or even reckless, in suspending ongoing operations in the Blocks and consciously ignoring the risks of environmental harm and production losses. By suspending operations on short notice,[378] Perenco acted in reckless disregard even in relation to its own rights, even though it foresaw that Ecuador would be forced to respond. Even if Perenco were permitted in principle to suspend operations, Perenco could not do so regardless of the risks. Mr. Perrodo repeatedly conceded that he decided to suspend operations despite his full awareness of the risks. Specifically, Mr. Perrodo admitted that he was aware that suspending operations involved serious risks, including production losses in Blocks 7 and 21 and environmental damage to the Ecuadorian Amazon.[379] He recognised that these risks would force Ecuador to respond and might result in *caducidad*.[380] He admitted that, consciously disregarding these serious risks, he decided to suspend operations in Block 7 and 21.[381]

331. Ecuador argued further that Perenco's conduct during the Parties' negotiations was negligent and led to the breakdown of negotiations. It had rejected Ecuador's proposals,

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377 Resp. PHB Q., paragraph 169, fn. 265 referring to Cl. Rep. Q., paragraph 208 ("... in *Goetz II*, the tribunal reduced the damages awarded to claimants on the grounds that claimants had failed to comply with the applicable exchange regulation. […] In *Occidental II*, the tribunal recognized that 'an award of damages may be reduced if the claiming party also committed a fault which contributed' to its loss, and held that in that case the investor 'acted negligently and committed an unlawful act' in failing to obtain prior ministerial authorization to transfer rights under its participation contract. […] In *Yukos*, the tribunal found that, unlike other Russian companies, Yukos 'breached the legislation and abused the low tax regimes…through the sham-like nature' of its operations in certain regions") (citing *Antoine Goetz & Consorts et S.A. v. Burundi*, Award, 21 June 2012, ¶ 258, EL-289; *Occidental Petroleum Corporation and Occidental Exploration and Production Company v. Ecuador*, Award, 5 October 2012, ¶¶ 678-679, CA-431; *Yukos Universal Ltd. v. Russia*, PCA Case No. AA 227, Final Award, 18 July 2014, ¶¶ 1611, 1615, CA-447). *Gemplus* is the exception that proves the rule: the tribunal rejected contributory negligence only because it was impossible for the claimants to have known that its employee had a criminal past. *Gemplus v. Mexico*, Award, 10 June 2010, ¶ 11.14, CA-439."

378 Decision on Liability, paragraph 199: "On 13 July 2009, Perenco and Burlington jointly wrote to Minister Pinto to inform Ecuador of the Consortium's intention to commence the suspension of its operations on 16 July 2009."

379 Tr. Q. (2) 554:13-555:12 (Perrodo).

380 Tr. Q. (2) 560:11-19 (Perrodo).

381 Tr. Q. (2) 561:3-8 (Perrodo).

making the negotiation process even more difficult. Contrary to what Perenco alleges, the Tribunal never found that Perenco was justified in terminating the negotiations based on "Ecuador's unlawful coercion."[382] Perenco's failure to "make its best efforts" to finalize the renegotiation of the Participation Contracts pursuant to the *Actas de Acuerdo Parcial* of October 2008, after having signed three partial agreements throughout 2008, amounted to an "unjustified" termination of the negotiation which gave rise to *culpa in contrahendo*.[383]

332. Ecuador further argued that Perenco could not rely on the argument that Ecuador's unlawful conduct was the proximate cause of *caducidad*. A single event might have multiple proximate causes. The doctrine of contributory negligence depends on this possibility. Contributory negligence reduces compensation exactly when the respondent and the claimant both contribute to or proximately cause the claimant's loss. Article 39 of the Articles on State Responsibility deals with this situation.[384] Ecuador's alleged proximate causation does not change the fact that Perenco's refusal to pay its Law 42 taxes and its decision to abandon the oil fields directly contributed to *caducidad*.[385]

333. Finally, if Perenco referred to *coactivas* and the oil auction as the proximate cause of *caducidad*, Perenco's reckless decision to suspend operations in the Blocks were a more direct cause of *caducidad* than the *coactivas* and the oil auction.[386]

2. Perenco's Position

334. Perenco responded that Ecuador bears the burden of proving two elements of its contributory fault theory. First, Ecuador must show that Perenco committed a wrongful act, whether intentional or negligent; bad business decisions that might have increased the

382 Resp. Rej. Q., paragraph 519.
383 *Ibid*.
384 ILC Articles, Art. 39, comment 1.
385 Resp. PHB Q., paragraph 181.
386 *Idem.*

investor's risks do not rise to the level of culpable fault capable of supporting a finding of contributory fault.[387]

335. Perenco's refusal to pay the Law 42 amounts cannot be characterised as negligent because the Tribunal has already rejected Ecuador's claim that Perenco had no legal basis to withhold Law 42 payments. The Tribunal has acknowledged that Perenco was justified in withholding direct payment of Law 42 dues after commencement of the arbitration.[388] Perenco legitimately expected that Ecuador would comply with the Tribunal's binding orders and that this relieved Perenco from making those direct payments. Its refusal thus could not be characterised as a culpable act that manifested a disregard for Ecuador's rights and for which Perenco should be penalised.

336. Moreover, given the position taken by two Ecuadorian Attorney-Generals that Law 42 was not a tax law and that the dues collected pursuant to it were not collected by Ecuadorian tax authorities, it was not reasonable and realistic to suggest that Perenco should have paid Law 42 dues to Petroecuador and then petitioned Ecuador's tax authorities in order to contest them.[389]

337. In relation to Perenco's suspension of operations following Ecuador's disregard of the Tribunal's Decision on Provisional Measures and issuance of *coactivas*, the Tribunal had found that Perenco's suspension of operations was justified under the *exceptio non adimpleti contractus* principle. The defence was open to Perenco and that therefore Perenco could lawfully suspend operations when faced with a breach of contract without itself being found to be in breach.[390] And, as Mr. Perrodo had testified, there had been no interruptions in operations and the company had taken the decision to suspend only as a last resort.

338. Regarding Perenco's alleged failure to obtain Burlington's agreement to abandon the Participation Contracts and agree to an unspecified future contractual form, the Tribunal

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387 Cl. Rep. Q., paragraphs 202-216.

388 *Ibid.*, paragraphs 219-221.

389 Cl. PHB Q., paragraph 134.

390 Decision on Liability, paragraphs 435 & 704; 412.

had found that Perenco was not liable for Burlington's decision not to abandon its contractual rights, that Burlington had good reasons for doing so, that Ecuador acted abruptly and coercively during the negotiations, and that Ecuador – not Perenco – was responsible for the failure of negotiations.[391] In any event, Ecuadorian law recognises that liability for breaking off contractual negotiations (*culpa in contrahendo*) does not arise unless there are exceptional circumstances. There can be no liability if there was a legitimate basis to end negotiations. Even if Perenco had terminated negotiations (which, as the Tribunal found, was not the case), Ecuador's unlawful coercion of Perenco would have been a more than sufficient justification.[392]

339. Perenco argued further that Ecuador could not show the second element of contributory fault, namely, that this fault interrupted the chain of causation. Contributory fault requires conduct by the investor that breaks the causal nexus such that the injury can be considered severable.[393] Perenco pointed out that Ecuador's own authorities recognised that wrongful conduct by the investor that is a concurrent cause for the loss does not exonerate the State from liability altogether. Ecuador must prove that Perenco would have suffered the loss even if Ecuador had not committed its unlawful acts.[394]

340. The Tribunal has already confirmed that Ecuador's unlawful conduct was the proximate cause of *caducidad*. This was not addressed by Ecuador at the Quantum Hearing.[395] Ecuador could not establish that any of the above was the proximate cause of Ecuador's declaration of *caducidad*. It was Ecuador's choice in exercising its discretion that directly triggered *caducidad*.[396]

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391 Cl. Rep. Q., paragraph 226.

392 *cf.* Decision on Liability, paragraphs 609-612; 621-625.

393 Cl. Rep. Q., paragraph 213.

394 *Ibid.*, paragraph 215.

395 *Ibid.*, paragraph 136.

396 *Ibid.*, paragraph 234 citing Decision on Liability, paragraphs 708, 710.

341. Further, Perenco had made it clear it would resume operations if Ecuador complied with the Tribunal's Decision on Provisional Measures.[397] If that had occurred, the Consortium would have continued to operate the Blocks, and Ecuador would not have declared *caducidad*. The proximate cause was therefore Ecuador's failure to comply with the provisional measures, not Perenco's later suspension of operations.[398]

342. Ecuador also did not declare *caducidad* due to Burlington's attitude but because of a suspension that was caused by Ecuador's failure to comply with the Decision on Provisional Measures.

343. Finally, Perenco pointed out that Ecuador did not deny that its contributory fault defence was limited to *caducidad* in any event. Even if it had any legal or factual basis, it could not affect damages for Ecuador's violations of Article 4 of the Treaty or for its breach of the Contracts through Decree 662.[399]

3. The Tribunal's Decision

344. The Tribunal recalls that Article 39 of the ILC Articles, entitled "*Contribution to the injury*", states that in the determination of reparation, "account shall be taken of the contribution to the injury by wilful or negligent action or omission of the injured State or any person or entity in relation to whom reparation it sought."[400] While the inclusion of the word "wilful" broadens the scope of the article beyond negligence, such broadening does not, in the Tribunal's view, appear to be substantial. The ILC Commentaries noted in this regard that the focus "is on situations which in national law systems are referred to as 'contributory negligence', 'comparative fault', '*faute de la victime*', *etc.*[401] Commentary (5) to the article notes further that it allows to be taken into account "*only* those actions or omissions which can be considered as wilful or negligent, *i.e.* which manifests a lack of

397 CE-238; CE-243; Decision on Liability, paragraph 692.
398 Cl. Rep. Q., paragraph 236.
399 Cl. PHB Q., paragraph 137.
400 ILC Articles, Article 39.
401 *Ibid*., Commentary (1).

due care on the part of the victim of the breach *for his or her own property or rights*."[402] The Tribunal therefore proceeds on the basis that in order for Ecuador's submissions to succeed, the Tribunal must be satisfied that Perenco manifested a lack of due care for its own property or rights.

345. Ecuador has identified a number of instances where it considers Perenco contributed to the damages which it has suffered.

346. Putting them in rough chronological order, the first is the contention that Perenco's overall conduct during the negotiation process contributed to its loss in that on several occasions, Perenco rejected Ecuador's proposals, thus making the negotiation process more difficult, refused to discuss drafts of transfer agreements that Ecuador proposed on 16 May 2008 and 10 July 2008, did not make its best efforts to finalise the new renegotiation of the Participation Contracts into services contracts as agreed in the October 2008 *Actas*, failed to secure Burlington's agreement to the final draft transitory agreement despite knowing that such failure would have serious consequences, and "cynically" sought to reopen the negotiations in May 2009.[403]

347. Second, Ecuador contended that Perenco's refusal to comply with Ecuadorian law and pay Law 42 dues was "grossly negligent."[404]

348. Third, Perenco's boycott of the auctions of the seized oil during the *coactiva* process and its threatening legal action against any company that participated in the auction was said to have contributed to its loss.[405]

349. Fourth, Perenco was said to have acted negligently and recklessly in suspending operations while consciously ignoring the risk of environmental harm and production loss. In doing

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402 *Ibid*., Commentary (5).

403 Resp. Rej. Q., paragraphs 517-519.

404 Resp. PHB Q., paragraph 166; Resp. Rep. PHB Q., paragraph 106. In an earlier version of this contention, Ecuador seemed to argue that Perenco was negligent when it stopped paying despite the fact that it was economically capable of doing so (Resp. C-Mem. Q., paragraphs 316, 323).

405 Resp. Rej. Q., paragraphs 523-524.

so, Perenco acted in "reckless disregard for its own rights" despite specifically foreseeing that Ecuador would be forced to respond.[406]

350. Fifth, Perenco's failure to resume operations in the Blocks (after having suspended operations) despite invitations for it to do was also said to have contributed to the harm which it suffered.[407]

351. Before addressing these claimed instances of contributory fault, it is worth noting that the first completed breach, Decree 662, set in train two main types of damage: (i) a further reduced "take" for the contractor; and (ii) the virtual immediate cessation of drilling activity in both Blocks. Perenco in no way contributed to the damage proximately caused by this measure. Indeed, the various acts complained of by Ecuador all followed Ecuador's decision to ratchet up the State's take from 50% of the 'above reference price revenues' to 99%.

352. Some of the alleged instances of contributory fault can be dismissed summarily. The Tribunal cannot accept that Perenco's overall conduct during the negotiation process contributed to its loss. None of the alleged instances of contributory fault said to arise from Perenco's responses to Ecuador's contractual demands can be considered to amount to wilful or negligent conduct within the meaning of Article 39 of the ILC Articles. The Tribunal has already found that it was Ecuador that escalated its demands and threats over time and that for its part Perenco sought to accommodate such demands to the best of its ability.[408] For example, the failure to secure Burlington's consent to the terms of the October 2008 *Acta* simply cannot be viewed as being within Perenco's control, let alone a wilful or negligent act on its part.

353. Likewise, for two reasons, Perenco's decision to suspend operation of the two Blocks in July 2009, which the Tribunal has already found in its Decision could be justified under

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406 Resp. PHB Q., paragraph 171; Resp. Rep. PHB Q., paragraph 106,

407 Resp. Rej. Q., paragraph 505.

408 Decision on Liability, paragraph 625.

Ecuadorian law[409], cannot be viewed as a wilful or negligent act which contributed to the harm that it ultimately suffered. The Tribunal has found that Ecuador committed a breach of contract by failing to comply with the Tribunal's Decision on Provisional Measures, that Perenco had a contractual right to expect Ecuador's compliance with such, and that faced with Ecuador's refusal, Perenco had the right to suspend performance under Ecuadorian law.[410] (The Tribunal also found that just as Perenco had a right to suspend performance Ecuador had a correlative right to intervene in order to operate and protect the Blocks.[411]) Ultimately, it was the State's decision to declare *caducidad* that amounted to the last completed breach.

354. To the extent that Ecuador traces this back to a refusal to pay Law 42 dues, as discussed below, given the intermediation of the Decision on Provisional Measures, the Tribunal cannot find that Perenco contributed to Ecuador's decision to expropriate its interests in the Blocks.

355. In addition, to the extent that Ecuador complains that, for example, the day after Perenco suspended operations, it notified its employees in the Blocks that their employment contracts were terminated, and therefore it "prematurely manufactured a situation in which was difficult to resume operations"[412], in the Tribunal's view, Ecuador has not quantified the loss that it might have suffered when Petroamazonas had to take over production, nor has it shown that laying off employees led to a loss occasioned to Perenco for which Perenco now seeks compensation. (The issue of employee costs is comprehended in the calculation of lost profits for Block 21 and does not arise to any significant degree in

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409 *Ibid.*, paragraphs 434 – 435.

410 *Ibid.*, paragraph 417. In the Tribunal's view, a plain reading of clauses 22.2.2 indicates that the contracting parties agreed that they would comply not only with a final award (i.e., in Spanish, the '*laudo*' issued by a tribunal), but in addition, they would observe and comply with the decisions (i.e., in Spanish, the '*decisiones*') of the tribunal. 657 The latter term constitutes a more capacious category of tribunal decisions of which the final award forms a part. Thus, under the Participation Contracts, Ecuador was bound to comply with the Decision on Provisional Measures and its failure to do so constituted a breach of contract.

411 *Ibid.*, paragraph 704.

412 Resp. Rej. Q., paragraph 507.

relation to Block 7 since *caducidad* applied only to the remaining one month of the Block 7 Contract's life.)

356. As to the steps taken by Perenco to refuse to pay Law 42 dues and instead depositing them in an off-shore account rather than paying them to Ecuador (which began after the dispute was submitted to arbitration but before the Tribunal issued its Decision on Provisional Measures and therefore initially was taken without the cover of a tribunal decision), in the Tribunal's view, Perenco *did* assume the risk that the Tribunal might not uphold its legal position in all respects. In addition, by declining to pay Law 42 dues to Ecuador, it was or should have been reasonably foreseeable to Perenco that this could invite a strong response from the State.

357. Such a response did in fact occur in the form of Ecuador's notice of its intention to commence *coactivas* in order to liquidate Perenco's Law 42 debt for 2008.[413] To that extent, Perenco's action exacerbated the situation, but this is not the end of the analysis of this claimed instance of contributory fault. Not long after the Tribunal held its first meeting with the Parties –at which Perenco had foreshadowed the possibility of a provisional measures application– such an application was in fact made. The Tribunal ended up granting Perenco's request and recommended such measures. The Tribunal specifically recommended that Ecuador refrain from taking *coactiva* measures against Perenco and further called upon the Parties to negotiate an escrow arrangement that would preserve their respective claims to the disputed funds pending the outcome of the arbitration.[414] This proved not to be possible for Ecuador. Ecuador explained its view in a respectful and nonconfrontational manner that it could not comply with the measures recommended by the Tribunal and that it was bound to initiate the *coactivas*. But the Tribunal later found in its Decision on Liability that Perenco was within its contractual rights to expect that Ecuador would comply with the Tribunal's provisional measures recommendations.

358. The Tribunal recalls the relevant findings in its prior Decision on Liability:

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413 Decision on Provisional Measures, paragraph 22.

414 *Ibid.*, paragraphs 79, 80.

> "694. The Tribunal has already found that Perenco had a reasonable expectation under the Participation Contracts that Ecuador would comply with any decision of the Tribunal. This contractual expectation was buttressed by the general expectation that any disputing party has that once the dispute is submitted to arbitration, both parties will seek to conform their conduct to the Tribunal's directives, particularly with respect to the non-aggravation of the dispute.
>
> 695. Ecuador found itself unable to comply with the Tribunal's Decision in this case. The Tribunal can well understand why in 2009, in applying a domestic law, Ecuador would wish to liquidate the amounts claimed to be owing for 2008. However, when the matter was put before the Tribunal, Ecuador's duty to enforce the law conflicted with its contractual obligation to comply with decisions of the Tribunal. The Tribunal recommended what it considered to be a reasonable way to protect both Parties' rights pending a final determination of their dispute. Regrettably, this was not possible in the circumstances. Perenco is correct to point out that had the State stayed its hand in relation to the *coactivas*, the dispute would not have been aggravated in the way in which it was."[415] [Emphasis added.]

359. In adversarial proceedings, a disputing party's view of its adversary's conduct as unacceptable or inappropriate is usually viewed by the other party as perfectly acceptable and appropriate in the circumstances. In the Tribunal's view, it is wrong to equate a party's zealous protection of its legal rights and interests with wilful conduct or contributory negligence within the meaning of the ILC Articles. Perenco did assume a risk when it unilaterally decided to pay the Law 42 amounts into an offshore account. However, and crucially, it then obtained the protection of a Tribunal recommendation that Ecuador not take *coactiva* action, as well as a recommendation that the Parties agree an escrow account arrangement so that the disputed Law 42 dues could be paid into it pending the outcome of the arbitration (an arrangement which proved to be unattainable in the circumstances).

360. Perenco was, in the circumstances, entitled to rely upon the Tribunal's recommendation and this cannot be considered to be a wilful or negligent contribution to the loss that it ultimately suffered when Ecuador enforced the *coactivas*. While Perenco's act of self-help *prior* to the Tribunal's consideration of its request for provisional measures was aggressive and perhaps even provocative, it must be viewed in context. Ecuador itself was hardly

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415 Decision on Liability, paragraphs 694-695.

blameless in terms of the way in which it escalated pressure on Perenco.[416] In the end, since provisional measures were granted, the Tribunal does not find Perenco's conduct in this regard to be wilful or negligent within the meaning of the ILC Articles once that conduct received the colour of right conferred by the Tribunal's ruling in Perenco's favour. At that point, Perenco was legally entitled to act as it did and it was Ecuador that acted inconsistently with the Tribunal's recommendation.

361. Although the Tribunal declines therefore to find this to be an act of contributory fault, one aspect of Ecuador's argument is accepted. As discussed below, Ecuador's point is addressed through the Tribunal's calculation of the damages owing. In deciding the amount of compensation owing for the unlawful imposition of Decree 662, the Tribunal has agreed with Brattle's view that if a party that claims compensation for the levying of a tax has not actually paid some or all of the tax, it cannot be compensated for that part of the damages which have been calculated on the assumption that the tax was paid. Thus, the Tribunal's 'true-up' addresses this aspect of Ecuador's contributory negligence argument.

362. Turning to the conduct of the auctions of oil seized through the *coactivas*, once again the Tribunal agrees that Perenco contributed to the depressed price of oil obtained in the *coactiva* auctions (by threatening suit against would-be purchasers). But when considered in light of the provisional measures already granted by the Tribunal, Perenco has the better position. Ecuador was evidently able to sell the seized oil at the market price. Given that it was the purchaser of the oil, it benefited from the depressed purchase price yet credited Perenco's Law 42 debt with the depressed price rather than the market value of that oil. In

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416 Such as, for example, blaming Perenco for failing to get the *Acta* agreed and threatening it with termination and even expulsion from the country. In its Decision on Liability, paragraphs 144-145, with reference to the Parties' correspondence, the Tribunal recounted the fact that on 24 December 2008, Perenco received a letter from the Ministry of Mines and Petroleum stating that "as a result of the impossibility of arriving at a final agreement between the parties, due to the intransigent position of your partner Burlington Resources, I would be very grateful if you would immediately instruct your work team to initiate the process of reversion of Block 7, the contract for which ends in the year 2010. Moreover, PERENCO, in its capacity as Operator, must also immediately assign its negotiating team to early termination of the Block 21 contract, by mutual agreement." Perenco then wrote to the Minister of Mines and Petroleum requesting him to reconsider the position expressed in the letter of 24 December 2008. But on 21 January 2009, the Minister of Mines and Petroleum announced that the negotiations to have Perenco continue operating in Ecuador had become "practically impossible."

doing so, it realised an enrichment that in the Tribunal's view, having regard to the status of the provisional measures ruling, it would be unjust to enjoy.[417] For that reason, the Tribunal cannot find that Perenco acted wilfully or negligently in standing on its rights and threatening suit against would-be purchasers. In all of the circumstances, it was unfair for Ecuador to buy the oil at a discount and then credit Perenco for only that depressed value. For that reason, the Tribunal also includes this in the 'true-up' adjustment to the damages, an adjustment that this time redounds to Perenco's benefit.

363. Therefore, the various claims of contributory negligence are unavailing.

H. The 'true-up' issue

364. This takes the Tribunal to the final part of the damages exercise, which is to consider Ecuador's 'true-up' case. The essence of the case is that Ecuador considers, among other things, that since the Tribunal found no breach of contract or the Treaty for Law 42 at 50% and because, on Ecuador's reading of the Contracts, their economy was never disturbed at 50% or at 99%, Perenco owes it a substantial amount of unpaid Law 42 dues.

1. Ecuador's Position

365. Ecuador contended that the damages owed to Perenco were either nil – once offsetting dues said to be owed under Law 42 are included in the analysis (the "true-up") or at best the Respondent owed Perenco US$114.3 million.[418]

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417 Decision on Liability, paragraph 703.

418 Brattle ER III, Table 1.

Table 1: Summary of Damages (US$ mn)

			Stabilisation Scenario			
			#1 (No Stabilisation)	#2 (Stabilisation Decree 662 Only, New X Factor)	#3 (Hypothetical Tax Threshold at 81%)	#4 (Stabilisation Decree 662 Only, Side-Payment of Oil)
Gross Damages						
FET Claim (Oct-07)	[1]	See note	0.0	3.6	62.9	184.4
Expropriation (Jul-10)	[2]	See note	13.7	13.7	13.7	13.7
Gross Harm	[3]	[1]+[2]	13.7	17.3	76.6	198.1
True Up						
#1 (Auction Prices)	[4]	See note	216.2	216.2	216.2	216.2
#2 (Market Prices at Date of Production)	[5]	See note	125.6	125.6	125.6	125.6
#3 (Market Prices on Auction Date)	[6]	See note	83.7	83.7	83.7	83.7
Damages Net of True Up						
Net of True Up #1	[7]	Max{[3]-[4],0}	0.0	0.0	0.0	0.0
Net of True Up #2	[8]	Max{[3]-[5],0}	0.0	0.0	0.0	72.5
Net of True Up #3	[9]	Max{[3]-[6],0}	0.0	0.0	0.0	114.3

Notes and sources:
All values in US$ mn as at September 2015, including simple interest.
[1] & [2]: Brattle Workpapers, Tables M3 & M4.
[4] to [6]: Table 2.

366. Ecuador argued that the Tribunal should apply the 'true-up' so as to account for the amount owed by Perenco to Ecuador as a consequence of: (i) the Consortium's withholding significant Law 42 dues (not only Decree 662 dues) since 2008; and (ii) Ecuador's having to fund the Blocks' operations for one full year from July 2009 until July 2010, while crediting the Consortium with production.

367. Brattle calculated three alternative 'true-up' figures depending on the price used to account for the oil seized and sold by Ecuador under the *coactivas* (higher prices meaning a lower debt for Perenco).[419] Ecuador contended that any compensation should take into consideration Perenco's contribution to the reduced sales price for the oil auctioned in the

[419] US$216.2 million (price at which Ecuador sold the seized oil), US$125.6 million (market prices as of the date of production of the seized oil), and US$83.7 million (market prices on auction date) (Brattle ER II, Table 1, p. vi). However, this distinction becomes irrelevant in three of the four stabilization scenarios analyzed by Brattle because the damages net of true up are US$0 regardless of the alternative used (Brattle ER II, Table 1, p. vi.).

coactivas process. It is undisputed that Perenco boycotted the auctions, which led to the seized oil being sold at below the prevailing market price.

368. Ecuador contended that the appropriate amount to be set-off is $216 million, given that Perenco illegally prevented Ecuador from selling the oil at a higher price. Should the Tribunal consider that Ecuador was to blame for the reduced auction, the set-off would be $125.6 million.

369. Brattle explained that the calculation of 'true-up' is *ex post* in nature (*i.e.*, it employs actual prices)[420] in contrast to the approach proposed by Brattle (accepted by the Tribunal) of calculating damages to Perenco *ex ante*. The 'true-up' must adopt an *ex post* perspective since it must assess what Law 42 amounts were actually paid by the Consortium and which levies remain outstanding. Ecuador asserted that Professor Kalt never took issue with the concept.[421] It further explained that imposing on Perenco the change in oil prices when it chose to withhold taxes was entirely appropriate, while also acknowledging that the allocation of risks was ultimately an issue for the Tribunal. Hence the sensitivity calculations that it performed of the "true-up."

2. Perenco's Position

370. Perenco takes issue with Professor Dow's claim that his analysis of the impact of Decree 662 as of October 2007 does not benefit from the use of hindsight. This is untrue. When Professor Dow calculated his "true-up" for Law 42 amounts and for the 2009-2010 operating expenses allegedly owed by Perenco to Ecuador, he improperly mixed his *ex ante* calculation with *ex post* data. This was not an inconsequential error. The oil prices produced as of October 2007 were substantially lower than the actual prices in the market. Thus, in Professor Dow's model, Perenco was made purportedly indifferent to Decree 662 in

420 Brattle ER II, paragraph 53.

421 Resp. Rep. PHB Q., paragraph 101(v).

October 2007 at relatively low forecasted prices, but that price of indifference sum is then offset by actual Law 42 assessments made on the basis of far higher prices.[422]

371. On this basis, Professor Dow calculated minimum and maximum true-up amounts of US$83.7 million and US$216.2 million, respectively.[423] Yet in Perenco's view, there is no reason why *ex post* data should be allowed to calculate Perenco's alleged liabilities, but not to calculate Perenco's entitlement to damages. In fact, such mixing of *ex post* and *ex ante* data fails to transfer the risks of oil prices to Ecuador, despite Professor Dow's claim that an *ex ante* approach "acknowledges this transfer of risk, for good or for bad, at the time of the expropriation."[424] Professor Dow's willingness to mix and match *ex ante* and *ex post* information when the result is reduction in Perenco's damages is unprincipled.

3. The Tribunal's Decision

372. For present purposes, the Tribunal considers that to the extent that a 'true-up' is appropriate with respect to *unpaid* Law 42 levies, after the Consortium suspended payment in April 2008, the true-up must adhere to the *ex ante* assumptions of future oil prices. Obviously, this issue is also linked to the level of taxation pursuant to Law 42 that the Tribunal has decided was not proven to be unlawful prior to the adoption of Decree 662 (*i.e.*, Law 42 at 50% up to October 2008 and Law 42 at 33% thereafter.)

373. Either way, the Tribunal agrees in this respect with Professor Kalt that Brattle mixed *ex ante* and *ex post* data in order to arrive at its true-up calculations for the difference between the tax payments assumed in the 4 October 2007 FMV estimation and the actual amounts that were subsequently calculated by Ecuador and imposed in the latter part of 2007-2008 before prices crashed, and again in 2010, when prices recovered.

374. Professor Kalt made the point as follows:

> "The hypothetical 'buyer' of rights in Brattle's framework (Ecuador) has essentially said to the hypothetical willing seller (Perenco): 'Back in

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422 Cl. Rep. Q., paragraph 255.

423 See Brattle ER III, Table 1 (also set out above).

424 Cl. Rep. Q., paragraph 256 citing Brattle ER II, paragraph 65.

> October 2007, we agreed I would pay you $X (plus interest) in 2015 for you to allow me to impose a 99% tax on your revenues for the life of the Blocks. As it turns out, market conditions were such that I've ended up levying $2X on you, but only actually collecting $.9X from you. So, I am going to deduct $1.1X ($2X minus $.9X) from X and I won't have to pay you anything. After all, you agreed in our fair market transaction back in 2007 to let me levy a 99% tax on you, and you took the risk that my tax assessments would turn out to be larger than either of us originally anticipated.'"[425]

375. The Tribunal agrees with the general thrust of this criticism.[426] Ecuador cannot have it both ways and must be held to its side of the compensation calculation. With an *ex ante* approach, the financial impact of the tax is assessed as of October 2007 and that is the measure of compensation. It would be unfair to permit Ecuador to take the position that an unforeseen increase in oil prices and consequently higher actual Law 42 levies should be imposed on Perenco when conducting the 'true-up'. By the Tribunal's acceptance of Ecuador's argument that damages must be calculated on an *ex ante* basis, this crystallises the tax's impact as of 4 October 2007 in the 'but for' world. Ecuador thus foregoes the right to seek additional amounts based on subsequent unforeseen market developments. Therefore, the Tribunal will not permit the difference between the anticipated levies used in the FMV calculations and the actual amounts levied to be set-off against Perenco.[427] The 'true-up' as originally calculated by Brattle has therefore been adjusted to take out Brattle's

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425 Kalt ER IV, paragraph 56.

426 The Brattle Group essentially admitted that this was the case at Brattle ER III, paragraph 103: "Professor Kalt is nevertheless correct that this approach to computing the true-up imposes on Perenco the risk of deviations between the price and production expectations implicit in our ex-ante assessment of the damages for Decree 662, and the prevailing prices and production when the various decisions to withhold payment, seize oil and vacate/enter the blocks occurred. Prevailing prices, production and costs at the time of the separate decisions to withhold payment, seize production and vacate/enter the blocks turned out to be at times higher and at times lower than those expected in October 2007, resulting in either higher or lower credits to Perenco than implicit in the ex-ante analysis of Decree 662." At paragraphs 106-107, Brattle sought to justify its approach, but the Tribunal considers that it would be most consistent with the *ex ante* approach to hold both Parties to the assumed financial impact of the tax going forward.

427 The Tribunal notes that Brattle has stated at fn 6 of its Brattle ER III that it performed this sort of calculation: "… we compute a fourth alternative, which uses October 2007 price expectations instead of outturn prices (whether actuals or coactivas auctions). This fourth measure insulates Perenco from the risk of deviations between the price expectations prevailing at the time Ecuador issued Decree 662, and when Perenco then withheld payment, Ecuador seized consortium production in response, and Perenco finally vacated/Ecuador entered the blocks. We present these calculations in Appendix E."

initial use of *ex post* pricing data which had the effect of increasing the amount that Perenco was said to owe Ecuador.

376. There are, however, some *ex post* developments that in fairness must be taken into consideration. The payment of damages for Decree 662 calculated on an *ex ante* basis assumes not only a particular oil price, as just discussed, but also that the person subject to the unlawful tax has actually paid it. The Consortium paid Law 42 dues at 99% from 4 October 2007 until 30 April 2008 when it opened the off-shore bank account into which Law 42 dues were thereafter deposited. Perenco would be unjustly enriched if it received damages for the period when it did not actually remit the Law 42 fees to Ecuador. Therefore, the Tribunal has taken that into consideration when calculating the true-up.

377. It has been further adjusted to reflect the fact that Perenco did not succeed in proving a breach of contract or Treaty in respect of Law 42 at 50%. However, it reflects the unlawful demand for an additional 49% of the extraordinary revenues as well as the Tribunal's finding that Perenco would have sought absorption pursuant to the Contracts' modification clauses and the Parties would have agreed to stabilisation at 33% as of October 2008.

378. Additionally, it has been adjusted to address Perenco's share of termination costs related to the implementation of Decree 662[428] as well as Ecuador's claimed expenses during the time of Perenco's suspension of its operatorship.

379. The 'true-up' must also address the *coactivas* issue in Perenco's favour. As the Tribunal noted in its earlier Decision on Liability, it was unfair and inequitable for Ecuador to seize Perenco's production in order to satisfy its tax payment demand and then to credit Perenco with the depressed price rather than the market price. The Tribunal acknowledges that this occurred in the contentious circumstances of Ecuador's non-compliance with the Tribunal's attempt to prevent the further aggravation of the dispute. It also notes that since Ecuador successfully defended the claims against Law 42 at 50%, Perenco's having assumed the risk that it would prevail on all claims exposed it to the situation it now finds

[428] Exhibits JK-64 and JK-51.

itself in, namely, that only the collection of Law 42 at 99% was found to amount to a breach for which compensation is due and therefore Law 42 at 50% – at least up until Decree 662 – must be presumptively treated as lawful. As the Tribunal noted in its previous Decision on Liability:

> "It considers that Perenco had a right to expect that Ecuador would desist from enforcing the *coactivas* during the pendency of the arbitration. It also considers that in deciding to withhold all Law 42 amounts claimed in 2008, Perenco assumed that the Tribunal would accept its claims that none of the Law 42 dues claimed by the State were permissible under the Contracts or the Treaty. Given that Perenco has not made out its claims in respect of Law 42 at 50%, the Tribunal holds that even though Ecuador should have complied with the Decision on Provisional Measures, the *coactivas* ought not to be included in the Tribunal's analysis of the measures said collectively to constitute an indirect expropriation…In addition, to the extent that Perenco has succeeded in its claim that the application of Decree 662 at 99% violated Article 4 of the Treaty, as found at paragraphs 606-607 above, the enforcement of the *coactivas* to collect the claimed additional 49% constituted a breach of the fair and equitable treatment standard, but it was not an expropriation of the investment.)."[429] [Emphasis added.]

380. In the end, neither Party emerges from this part of the dispute as the clear winner and the 'true-up' must reflect this mixed success.

I. Quantum Based on a 'Harmonised Model'

381. Before the Tribunal estimates the financial consequences on Blocks 7 and 21 in light of Ecuador's breaches, it is necessary to explain the methodology that was used to estimate the damages to be awarded for each individual claim in light of the factual and legal findings that the Tribunal has made in the preceding parts of this Award.

382. Having considered the Parties' submissions, the expert evidence and the other evidence on record, a 'harmonised model' was devised through which the Tribunal has calculated the damages to be awarded.

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[429] Decision on Liability, paragraph 703.

383. As described above, the Tribunal had been presented with damages valuation based on spreadsheet models submitted by Professor Kalt[430] and Brattle.[431] These models employed the same overall architecture[432] but differed in respect of five major assumptions, which were the main issues that separated the Parties as ultimately identified and addressed in Section II.B, as well as other minor differences in assumptions. Given these similarities, a 'harmonised model' could be produced through the adjustments of the models to implement the Tribunal's findings. These changes are described below and also describes the 'harmonised model' employed by the Tribunal.

1. The 'harmonised model'

384. The 'harmonised model' assumes away the effect of Decree 662 and *caducidad* in order to arrive at the net present value of the discounted cash flows that would have been derived from Blocks 7 and 21. This is based on the production decisions that the Tribunal has found Perenco would have made but for the unlawful measures. In order to address Professor Kalt's concerns, the Tribunal has employed the model to make an initial valuation of the damage caused by Decree 662 and then a second valuation of the damage caused by the declaration of *caducidad*.

385. The Tribunal finds that in the 'but for' world, Law 42 at 50% would have continued to apply from October 2007 until 5 October 2008 at which point, by party agreement, the rate would have been 33%, which rate would have applied from that date through to the respective expiry dates of the two Participation Contracts.

386. The Tribunal therefore first seeks to forecast the production in both Blocks in the 'but for' world for the first period and for Block 21 for the second period on an *ex ante* basis. After estimating the production levels, the production is then priced on the basis of *ex ante* expectations at the relevant times. The Tribunal then also seeks to estimate the amount of

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430 Prof. Kalt's spreadsheet models were provided as Exhibit JK-32 in the first round of pleadings on quantum and Exhibit JK-64 in the second round.

431 Brattle's spreadsheet models were provided as Tables B and C in the first round of pleadings on quantum and Tables P and O in the second round.

432 The similarities in the models reflected in part the fact that Brattle took Professor Kalt's original spreadsheet models and then adjusted them to reflect its own assumptions and inputs.

capital expenditure and operating expenditure, and other costs, associated with the assumed levels of production. The cash flows are then discounted to the relevant date of valuation, and then brought forward to the date of the Award at pre-award interest rates.

387. Finally, the true-up is applied to reflect the acts discussed previously that affect the quantum calculation.

388. The following sections explain further each of these steps taken in relation to the 'harmonised model'.

2. Valuation Dates

389. The first of the major assumptions that had to be adjusted in the 'harmonised model' was the relevant valuation dates. First, Professor Kalt's modelling of damages flowing from the period between October 2007 and June 2010, which was done on an *ex post* basis, was adjusted to reflect the Tribunal's conclusion that an *ex ante* analysis is to be employed. At the same time, Brattle's sequential 'two layer' approach was then adjusted to create a 'clean sheet' for damages in respect of the expropriation on 20 July 2010.

390. This means that the damages are estimated in respect of the 4 October 2007 breach on the basis of forecasted cash flows up until June 2010, and cash flows that would have occurred between October 2007 and June 2010 are discounted back to the October 2007 valuation date. For damages flowing from the July 2010 expropriation, this is based on forecasted cash flows until the expiry of the Blocks 7 and 21 Participation Contracts (16 August 2010 and 8 June 2021, respectively[433]). If a cash flow would have occurred after July 2010, this is discounted back to the July 2010 valuation date. The discount rate applied is 12%, which was the rate utilised by both Parties' experts.[434]

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433 Crick WS II.

434 Kalt ER III, paragraph 30 and Brattle ER II, paragraph 163.

3. Production and Investment

391. The second issue on which the experts' models differed was the investment and production to be forecasted 'but for' Ecuador's conduct. Professor Kalt's models reflected Mr. Crick's analysis and projections; the Brattle models reflected RPS' analysis and projections.

392. For Block 7, the Tribunal has estimated that 23 additional wells would have been drilled during the life of the Block 7 Participation Contract. Four wells would have been drilled by January 2008 and the remaining 19 would have been drilled between February 2008 and August 2009. Further, having concluded that Mr. Crick's production profiles as presented at the Quantum Hearing were to be preferred over those presented by RPS, and consistent with Mr. Crick's forecasts of new oil wells, the Tribunal accepts that all 'but for' wells during the production lifetime of Block 7 would be drilled in the Oso field within Area Base. The production volume calculated relies on Mr. Crick's forecasts[435] but which are slightly adjusted for purposes of an *ex ante* analysis as of October 2007.[436]

393. Mr. Crick also provided forecasts for Coca-Payamino. The 'harmonised model' adopts those numbers without amendments.[437]

394. On this basis, the Tribunal forecasts that the 'but for' production in Block 7 would have been as follows. This is broken down into 'base' production *i.e.* oil which would have been produced in addition to base production absent Decree 662, and 'incremental' production *i.e.* oil which would have been produced in addition to base production but for Decree 662. Risk-adjustment factors as used in Exhibit JK-94 were applied to reflect the proved and probable reserves planned.

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435 Crick WS III, Appendix B.

436 Mr. Crick's profile incorporates historical production figures for wells drilled prior to 2008 (see Crick WS II, paragraphs 6-8, 159, 172).

437 Crick WS III, Appendix B; Exhibit JK-94.

All values in stb mln	Risked production		
	Base	Incremental - Oso Only	Total
Block 7 Area Base			
Oct-07 to Jun-10	7.9	12.3	20.2
Jul-10 to Aug-10	0.3	0.4	0.8
Total	**8.2**	**12.7**	**21.0**
Coca-Payamino			
Oct-07 to Jun-10	4.9	n/a	4.9
Jul-10 to Aug-10	0.2	n/a	0.2
Total	**5.0**	**n/a**	**5.0**
Block 7 Total			
Oct-07 to Jun-10	12.8	12.3	25.1
Jul-10 to Aug-10	0.5	0.4	0.9
Total	**13.3**	**12.7**	**26.0**

Note: Gross production volumes.

395. In view of the Tribunal's decision on the Block 7 extension question, no forecasts for production in Block 7 from August 2010 onwards are made.

396. In relation to Block 21, the Tribunal has concluded that an incremental six wells would have been drilled pre-*caducidad* and 10 would have been drilled post-*caducidad*. The pre-*caducidad* wells are assumed to have been drilled on a one-well-per-month schedule with incremental production commencing in August 2008, consistent with the drilling schedule proposed by Mr. Crick.[438] Production for these six wells reflects the production from the first six wells (all 1P wells) according to Mr. Crick's schedule.[439]

397. The post-*caducidad* wells are assumed to have been drilled on a one-well-per-month schedule with incremental production commencing August 2010. In addition, Mr. Crick's testimony was that a small portion of oil produced from the new wells would have been produced from the existing wells, which were adjusted for in his profiles set out in his

438 Crick WS III, paragraph 3.

439 *Ibid.*, Appendix B.

witness statement.[440] Mr. Crick's small adjustment has been scaled to reflect the chosen production scenario.

All values in stb mln	Production		
	Base	Incremental	Total
Block 21			
Oct-07 to Jun-10	11.1	2.3	13.4
Jul-10 to Jun-21	23.2	5.8	28.9
Total	**34.3**	**8.0**	**42.3**

Note: Gross production volumes.

4. Prices for Oil Production

398. As alluded to above, *ex ante* prices are applied to the production from each Block. However, as the evidence showed and which was not disputed, the oil quality of each Block differs – Block 7 produced Oriente quality crude oil and Block 21 Napo quality. Therefore, the *ex ante* prices for oil production from each Block and over different time periods had to be calculated.

399. First, *ex-ante* WTI prices were used. These were NYMEX futures prices as of the two key dates of valuation: October 2007 and July 2010.[441] These prices were slightly increased to reflect an insurance component embedded in futures prices.[442]

400. Second, these prices were adjusted to reflect the differences in quality between WTI crude oil and that produced in Ecuador *i.e.* Oriente and Napo crude oil. Since Oriente crude oil is of a relatively higher quality than Napo crude oil, the former generally commands a higher price.[443] Using the historical price discounts applied to the two types of crude oil produced

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440 *Id.*

441 Brattle Workpapers, Table D.

442 Brattle ER II, paragraphs 214-219.

443 This difference is reflected in the historical price data exhibited in Exhibit JK-57 and Brattle Workpapers, Table D.

in Ecuador relative to WTI prices, the expected *ex ante* WTI prices were adjusted downwards to derive the expected *ex ante* Oriente prices, and downwards further for *ex ante* Napo prices.[444]

401. Third, these prices are adjusted further to reflect the specific quality of the crude oil produced in Blocks 7 and 21. These adjustments were made on the basis of the historical relationship between the prices and quality of the Oriente and Napo benchmarks and the prices and qualities of the field-specific oil, and the resulting field-specific price adjustment factors are consistent with formulas detailed in Ecuador's own calculations of oil prices in its Law 42 assessments.[445] The field-specific adjustment factors are then applied to the benchmark oil prices in Ecuador (Oriente for Block 7 Area Base and Napo for Block 21) to generate field-specific prices.[446]

5. Operating Expenses (OPEX)

402. Benchmark operating costs have been adopted in the 'harmonised model'. This is consistent with the experts' financial models which both used similar operating cost calculations. However, these calculations were adjusted to reflect an *ex ante* modelling perspective as of the two valuation dates. Reliance has largely been placed on the benchmarks found in Exhibit JK-64, but with the Amazonian Eco-development Fund ("*Fondo ecodesarrollo región amazónica*") benchmarks adjusted to reflect the increase in its rate between the two valuation dates. This was done by using a 2006-2007 average of the cost for the October 2007 to June 2010 period and the 2008 cost for the post-July 2010 period.[447] The 'harmonised model' used by the Tribunal continues to inflate the benchmark operating costs over time, which is consistent with the expert evidence on this issue.[448] It also credits Ecuador with the outstanding AGIP pipeline tariff balance as of October

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444 Exhibit JK-57 and Exhibit JK-96; Brattle Workpapers, Tables D and E; Kalt ER III, paragraphs 35-36; Brattle ER II, fn. 42.

445 E-228.

446 Exhibit JK-57, Exhibit JK-96, and Brattle Workpapers, Table E.

447 See Exhibit FL13 (Audit Report - *Dirección Nacional de Hidrocarburos*).

448 Kalt ER III, paragraph 103; Brattle ER II, paragraphs 225, 230.

2007.[449] Accordingly, the relevant OPEX benchmarks for Blocks 7 and 21 are shown in the table below. These values are applied to production volumes, where appropriate.

	Block 21	Block 7	
		Area Base	Coca-Payamino
Variable Operating Costs			
$ per Contractor Barrel of Oil			
Amazonian Eco Fund, 2006-07	$0.49	$0.60	$0.52
Amazonian Eco Fund, 2008 onwards	$1.02	$0.98	$1.02
Other	$0.87	$2.33	$2.24
$ per Gross Barrel of Oil			
Non-Deductible	$0.03	$0.00	$0.05
Deductible	$0.60	$1.19	$1.52
Total	$0.63	$1.19	$1.57
$ per Barrel of Fluid	$0.43	$1.27	$1.62
Fixed Operating Costs			
$ per Month	$410,058	$0	$408,512

Note: Estimated using account information contained in FL13 & JK-49.

6. Capital Expenditure (CAPEX)

403. In relation to the productions forecasted for Block 7 as set out above, the Oso capital expenditure is based on Mr. Crick's evidence which was utilised by Professor Kalt in his financial model.[450] All assumed capital expenditures reflect the same essential build-up of individual per-well and facilities costs reflected in Professor Kalt's first Quantum calculations[451] but adjusted to reflect the Tribunal's conclusions that (i) 4 wells would have been drilled by January 2008 and 19 wells drilled between February 2008 to August 2009; and (ii) the starting point for calculations should be on an *ex ante* basis. The relevant capital

449 Brattle ER III, fn. 232; Brattle Workpapers, Table N; Kalt ER III, paragraph 104; Kalt ER IV, p. 121.

450 See Crick WS II, Appendix C for Block 7's Oso; and Exhibit JK-94 which includes Crick's inputs.

451 Kalt ER III, paragraph 112.

expenditure is risked to reflect the proved and probable reserves planned.[452] The resulting Block 7 expenditures total US$140.8 million.

404. For Block 21, capital expenditure is estimated following cost information contained in Mr. Crick's Yuralpa development plan.

405. Mr. Crick's capital expenditure was adjusted to reflect the 16-well programme as found above. According to Mr. Crick's Yuralpa development plan, the timing of fluid handling capital expenditure is tied to when overall fluid rate (oil plus water) approaches predetermined thresholds. The 16-well scenario results in a slower fluid rate increase compared to Mr. Crick's original scenario. This slower fluid rate increase in the 'harmonised model' causes delays for some capital expenditures relative to Mr. Crick's original schedule. Since Mr. Crick considered the first 16 wells in his drilling programme to be 1P wells, risking is not necessary.

406. Further, Mr. Crick considered that the water produced in relation to 24 wells would have been limited to 120,000 barrels of water per day (bwpd). Given the number of wells the Tribunal considers would have been drilled, the Tribunal considers that water production would have been limited to 120,000 bwpd, *i.e.* there is no additional water production that needed to be addressed, and therefore there is no need to further adjust for water sensitivities.

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452 *Ibid.*, paragraph 107.

407. The estimated Block 21 capital expenditures are as follows:

All values in $ mln	Capex
Block 21	
Oct-07 to Jun-10	86.3
Jul-10 to Jun-21	47.8
Total	**134.1**

7. Net Present Value of Cash Flows

408. The section above sets out the Tribunal's forecasts for productions in Block 7 and 21 over the two periods of time. In relation to the production between October 2007 and June 2010, the Tribunal has priced that production on the basis of *ex ante* expectations in October 2007 of oil prices for each month during this period. Likewise, production from July 2010 onwards was priced at *ex ante* July 2010 expectations for each month after July 2010.

409. The cash flows derived from each period are then discounted at a rate of 12% to October 2007 and July 2010, respectively. The discounted cash flows derived for the two periods are then added up.

410. Prejudgment interest is then added to the net present value as of 2007 and 2010 to bring them forward to the date of the Award. First, monthly yields on 10-year US Treasury notes[453] are used as the risk-free benchmark rate. This rate stood at 4.53% in October 2007 and had fallen to 1.75% as of 11 September 2019. Second, in each month between the dates

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453 This is based on actual historical published annualised yield of the 10-year US T-note as reported by the US Federal Reserve and published daily by the US Federal Reserve Board. This historical yield data is contained in Prof. Kalt's Exhibits JK-39 and JK-77C, as well as Brattle Exhibits BR-20 and BR-116. The Tribunal understands that Federal Reserve publishes annualised yields. The experts have consistently used the same series of annualised yields throughout the quantum proceedings. Accordingly, a standard formula has been used to translate the published annual yields to their monthly equivalents: $Monthly\ rate = (1 + Annual\ yield)^{1/12} - 1$.

The series has been subsequently updated to include more historical data, and the most recent calculations include accrued prejudgment interest through to September 2016.

of valuation and the date of the Award, the monthly prejudgment interest amount is computed by applying the monthly interest rate[454] to the outstanding damages balance including all accrued prejudgment interest up to the start of that month. Third, different cumulative prejudgment interests are applied which reflects the different time periods over which the prejudgment interest accrues.[455]

411. Accordingly, based on this, the initial amount of damages estimated to be awarded for Block 7 is calculated to be US$145.2 million and the amount of damages to be awarded for Block 21 is calculated to be US$273.7 million, totalling US$418.9 million (as of September 2016). As explained below, certain further adjustments must also be made.

8. The 'True-Up'

412. The Tribunal must now consider the implications for the quantum of damages thus far calculated in light of the matters discussed above. First, Perenco had not paid Law 42 dues since 30 April 2008 and accordingly did not actually suffer losses in that respect. Second, where Perenco had paid those dues, there was an 'overpayment' of actual Law 42 dues paid relative to Law 42 dues which should have been paid based on *ex ante* price assumptions. Third, the *coactivas*. Fourth, and relatedly, Petroamazonas had incurred costs in operating the field in Perenco's absence. Fifth, there were termination costs associated with Perenco's exit.

413. Accordingly, the 'true-up' adjusts the quantum of damages already calculated as follows.

414. First, Ecuador is credited for the amounts of Law 42 dues that Perenco should have paid but did not pay since 30 April 2008 (based on *ex ante* prices).

415. Second, Perenco is given credit for the Decree 662 dues that it did pay calculated based on real world prices but which were in excess of Decree 662 dues already accounted for in the 'harmonised' model.

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454 See *ibid*.

455 This results in more prejudgment interest for damages relating to the October 2007 damages as opposed to that for 2010.

416. Third, the confluence of events and the Parties' various actions surrounding the *coactivas* has been taken into account.

417. Fourth, Perenco is credited in the 'true-up' for the termination costs that it actually incurred in response to Decree 662.[456] Perenco's share of the nominal termination costs is $4 million.[457]

418. Fifth, based on an *ex ante* analysis, Petroamazonas' costs based on the operating cost benchmarks (as already discussed above) and the barrels forecasted by Mr. Crick for the base wells during the relevant period is US$45.3 million (this is Perenco's share of the costs).

419. In light of these factors and the amounts involved, the Tribunal concludes that a fair amount for the 'true-up' should be US$36.4 million (after discounting and bringing forward the relevant cash flows). Thus, the total compensation for Blocks 7 and 21 is reduced by that sum to US$382.5 million.

9. OCP Deductibility

420. The Tribunal concludes that there should be full tax deductibility in relation to Block 21's OCP ship-or-pay costs. Accordingly, this adds US$9 million to the quantum to be awarded to Perenco. The amount of US$382.5 million is therefore increased by US$9 million to amount to US$391.5 million.

10. Value of Loss of Opportunity

421. Finally, the Tribunal concludes that this should be valued at US$25 million. This sum is added to the amount of US$391.5 million to arrive at a total of US$416.5 million as of September 2016.

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456 Based on Kalt ER IV, Exhs. JK-64 and JK-51.

457 Kalt ER IV, Exhibit JK-51.

11. Conclusion on Damages in relation to the breach of the Treaty and the Participation Contracts

422. The sum of US$416.5 million arrived at above is then brought forward to the date of this Award by means of multiplying that sum by an adjustment factor of 1.0776 to arrive at a final figure of US$448,820,400.00. This sum is the damages that are awarded to Perenco and shall be paid by the Respondent, the Republic of Ecuador.

III. DAMAGES CLAIMED IN RELATION TO THE ENVIRONMENTAL COUNTERCLAIM

A. Circumstances leading to the appointment of Mr. Scott MacDonald as Independent Expert

423. The Tribunal has already adverted to its decision to appoint an Independent Expert if the Parties proved to be unable to settle the environmental counterclaim in light of the findings of fact and law made in the Interim Decision on Counterclaim. By way of introduction to this part of the Award, it warrants repeating why the Tribunal acted as it did.

424. In the Interim Decision on Counterclaim, the Tribunal made the following observations:

> "581. The Tribunal has now arrived at the point where it has narrowed the counterclaim on the principal issues of law and fact. The Tribunal has set out the main issues of fact and law which have divided the experts. However, with regard to many of the IEMS/GSI differences, the Tribunal does not feel able to prefer one above the other. It seems to the Tribunal that each was attempting to achieve the best result for the party by whom they were instructed, and that they crossed the boundary between professional objective analysis and party representation. It is clear to the Tribunal that the experts were effectively shooting at different targets and this has made the work of this Tribunal most difficult.
> …
> 583. The Tribunal has carefully considered the evidence and has found that there are certain issues of fact on which it is extremely difficult for it to make proper determinations. As has been seen, the Tribunal has completely rejected the IEMS' mapping exercise based on background values and has found that the appropriate means for establishing the volume of contaminated soils is delineation. In addition, the Tribunal has rejected certain interpretations of the Ecuadorian regulatory standards applied by IEMS. In applying the proper regulatory standards, the Tribunal finds that the expert evidence from both sides does not provide a sufficient degree of confidence as to the actual conditions in the Blocks. The Tribunal considers that there are too many gaps and conflicts between IEMS' and GSI's evidence on these key issues. For example, GSI did not

take samples at all of the sites that IEMS tested; for certain sites where IEMS found contamination, GSI also tested the soil but took samples at different depths, and GSI used "indicator parameters" rather than testing comprehensively for all possible oilfield related contaminants. The Tribunal considers that these gaps must be filled and the technical conflicts must be resolved in order to arrive at a fair and proper disposition of Ecuador's counterclaim.

584. In its post-hearing submission, Perenco essentially posited that the Tribunal faces an 'all or nothing' decision:

The various technical issues on which GSI and IEMS so fundamentally disagree are relevant not because the Tribunal should take as its task picking and choosing between the experts on each issue one by one, cafeteria-style, to arrive at some hybrid approach. There is too much interrelationship between the issues to make that kind of exercise productive. Instead, those technical issues are relevant because they provide the basis on which the Tribunal can assess the two approaches, and the basis on which the Tribunal should conclude that GSI's approach is far more reliable and trustworthy than IEMS' approach.

585. While the Tribunal agrees with Perenco that given the present state of the evidence it should not "take as its task picking and choosing between the experts on each issue one by one, cafeteria-style" – because the Tribunal does not possess the requisite technical expertise to decide between experts' disagreements over highly technical issues – it is equally uncomfortable with simply picking one set of experts' conclusions over the other. The Tribunal well understands that the onus of proof is on a party who makes an allegation and it could be said that because of the doubt in which the Tribunal finds itself Ecuador could be said to have failed in tipping the burden in its favour. However, as the Tribunal is satisfied that there has been some damage for which it seems likely that Perenco is liable, the Tribunal is not disposed to dismiss the counterclaim *in limine*. Given the Constitution's embrace of the importance of the protection of the environment, the most accurate picture of the environmental condition of the Blocks possible – based on the prior sampling locations of both IEMS and GSI – must inform the Tribunal's decision on the counterclaim.

586. Accordingly, the Tribunal has concluded that it must require an additional phase of fact-finding in order to arrive at a proper and just conclusion. It is not content to issue a final determination on the extent of Perenco's liability on the basis of the current expert reports.

587. As already intimated, the Tribunal intends to appoint its own independent environmental expert who will be instructed to apply the Tribunal's findings set out above and work with the Tribunal and the Parties to enable the Tribunal to determine the extent of contamination in the Blocks for which compensation is owed.

> 588. The Tribunal wishes to underscore the fact that the expert chosen to conduct this investigation (after consultation with the Parties to ensure complete independence and impartiality) will be the Tribunal's expert and will be solely answerable to the Tribunal. In due course, the Tribunal will provide a protocol for the expert, setting out the precise questions to be answered in line with the findings made in this Decision. The Parties will be permitted to attend when the expert and his/her team carries out the necessary investigations and the Parties will receive a copy of the expert's report and will be permitted to comment thereon in due course. Naturally, the costs involved in this exercise will initially be borne by the Parties in equal shares with any subsequent allocation of costs to be determined by the Tribunal at the appropriate time.
>
> …
>
> 593. That said, the Tribunal considers it highly desirable for the Parties to take time to properly digest the contents of this Decision and its implications in the overall scheme of things, and they may wish to consider embarking on a mediation process or some other consensual procedure to assist in arriving at a mutually acceptable figure. Having regard to the Tribunal's findings in relation to: (i) background values; (ii) the temporal application of the 2008 Constitution to the facts of this case; (iii) the applicable standards under Ecuadorian law; (iv) the 2008 Constitution's variation of the limitations period; (v) the Tribunal's criticism of the narrowness of GSI's sampling practices; (vi) the Tribunal's rejection of IEMS' mapping and unit costs for remediation; and (vii) the fact the Tribunal will not permit the sampling of areas in the Blocks which were not previously sampled by either party's experts, the Tribunal believes that the remaining issues are most unlikely to lead to an award of damages anywhere near the amount claimed by Ecuador. The Parties will doubtless take all this into account as well as the considerable cost of the further enquiry which the Tribunal considers is absolutely necessary to arrive at a just result in the circumstances of this case in deciding whether it is possible for them to arrive at a mutually satisfactory resolution of this aspect of the dispute.
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> 594. The Tribunal's strong preference and hope is that after receiving this Decision and considering the Tribunal's findings, the legal aspects of the counterclaim will have been sufficiently clarified so as to enable the Parties to agree on a suitable amount of compensation with or without the assistance of an independent expert or a final Tribunal determination. In the event that such an agreement is reached, it will be recorded and included in the Tribunal's Award. If an agreement is not reached, the Tribunal will await the results of its expert's work and make a final decision which will be included in the Award."

425. As it turned out, the Parties failed to reach an agreement. They then jointly interviewed and agreed on the appointment of Mr. Scott MacDonald as the Independent Expert and the

Tribunal accepted their recommendation. Accordingly, Mr. MacDonald was formally appointed as the Independent Expert on 6 July 2016.[458]

426. Mr. MacDonald directed a team of environmental specialists of Ramboll in the design and conduct of the sampling campaign that the Tribunal contemplated in its Interim Decision on Counterclaim. Under the supervision of the Tribunal, Mr. MacDonald created field sampling protocols and was assisted by Jose Sananes, Clement Ockay, Miles Ingraham, Tais dos Santos, Pablo Yoshikawa, Adrian Gomez, Guillermo Gloria and Aldo Rodriguez (all from Ramboll).[459]

B. **Procedural History**

427. While Mr. MacDonald was reviewing the IEMS and GSI data and was designing his workplan, the *Burlington* proceeding concluded. Accordingly, on 2 March 2017, the Tribunal invited the Parties to comment on that tribunal's Decision on Reconsideration and Award and its Decision on Counterclaims.

428. On 18 April 2017, the Parties filed their comments. On the same date, Perenco also filed its First Dismissal Application.

429. On 18 August 2017, following the filing of the Parties' written submissions, the Tribunal issued its Decision on Perenco's First Dismissal Application. It rejected Perenco's First Dismissal Application and reserved costs for future determination.

430. On 27 October 2017, the Parties agreed on the Protocol for the Independent Expert's Second Site Visit.

431. On 30 January 2018, Perenco submitted a Second Dismissal Application. Perenco also proposed a briefing schedule in its letter accompanying the application and suggested that while the Tribunal considered Perenco's Second Dismissal Application, Mr. MacDonald should suspend work on his report, or complete his report but refrain from submitting it to

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458 Procedural Order No. 16.

459 Annex 2 to Protocol for the Independent Expert's Second Site Visit to Blocks 7 and 21 dated 27 October 2017.

the Tribunal and the Parties until the Tribunal's decision on the Second Dismissal Application.

432. On 31 January 2018, the Tribunal invited Ecuador to reply to Perenco's letter of 30 January 2018. Also, the Tribunal invited the Parties to agree, by 5 February 2018, on the briefing schedule for Perenco's Second Dismissal Application.

433. On 5 February 2018, Ecuador replied to Perenco's letter of 30 January 2018 and proposed an alternative briefing schedule for the Second Dismissal Application.

434. On 6 February 2018, Perenco requested the Tribunal for leave to reply to Ecuador's letter of 5 February 2018. On the same day, the Tribunal granted Perenco's request to comment on Ecuador's letter of 5 February 2018.

435. On 8 February 2018, Perenco replied to Ecuador's letter of 5 February 2018 regarding the schedule and procedure for determining Perenco's Second Dismissal Application.

436. On 9 February 2018, Ecuador asked the Tribunal for leave to respond to Perenco's letter of 8 February 2018. On the same day, the Tribunal granted Ecuador's request.

437. On 12 February 2018, Ecuador submitted a reply to Perenco's letter of 8 February 2018.

438. On 15 February 2018, the Tribunal informed the Parties that it would decide the Second Dismissal Application but at the same time Mr. MacDonald's work would continue. His Independent Expert's Report would be submitted to the Parties only if the Tribunal decided to deny Perenco's Second Dismissal Application.

439. On 15 March 2018, Ecuador filed its Response to Perenco's Second Dismissal Application.

440. On 5 April 2018, Perenco filed its Reply on Perenco's Second Dismissal Application.

441. On 26 April 2018, Ecuador filed its Rejoinder on Perenco's Second Dismissal Application.

442. On 30 July 2018, the Tribunal informed the Parties through a letter from its Secretary that the Tribunal had decided, by a majority, to dismiss Perenco's Second Dismissal

Application, and reasons for this decision, as indicated in that letter, are now provided in this Award.

443. On 3 October 2018, the Independent Expert informed the Tribunal that he would need additional time to complete his work and submit the Independent Expert Report. No useful purpose would be served by recounting the various exchanges between the Parties and the Tribunal relating to the inevitable delays in the production of what turned out to be a most detailed, useful and comprehensive report.

C. Perenco's Second Dismissal Application

444. The Parties' submissions and the Tribunal's reasons for its rejection of Perenco's Second Dismissal Application are set out as follows.

1. Perenco's Arguments

445. In its Second Dismissal Application, Perenco argues that "Ecuador asserted the same counterclaims in both the *Burlington* and *Perenco* arbitrations."[460] Perenco contends that "the *Burlington* arbitration has come to a final and irrevocable end, and Ecuador has now received payment of the entire amount due in respect of the counterclaims that it presented to the two tribunals" in performance of the settlement agreement between Burlington and Ecuador dated 1 December 2017 (the "**Settlement Agreement**").[461] Perenco submits that Burlington's settlement with Ecuador, and the full payment of the Burlington's and Perenco's joint counterclaims debt, means that Ecuador's counterclaims against Perenco should be dismissed.[462]

446. In its Reply, Perenco disagrees with Ecuador's contention that its Second Dismissal Application is untimely. Perenco contends that its failure to raise *lis pendens* cannot constitute a bar to its application, because "*lis pendens* is not a proxy for satisfaction of a

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460 Second Dismissal Application, paragraph 6.

461 *Ibid*., paragraph 19 referring to Annex 3, CE-CC-431.

462 Second Dismissal Application, paragraph 1.

liability, *res judicata*, mootness, or abuse of process."[463] According to Perenco, the situation resulting from the *Burlington* award and Burlington's payment would have been the same, "[e]ven if Perenco had sought, and this Tribunal had granted, a temporary stay based on *lis pendens.*"[464] Perenco further claims that its conduct cannot be construed as a waiver, for it "cannot conceivably have waived in advance the right to rely on intervening factual circumstances with dispositive effect on the arbitration."[465] Perenco adds that Ecuador's plea of estoppel cannot succeed in this case, as "Perenco had no 'contradictory behaviour', and Ecuador did not change its position in detrimental reliance on Perenco's failure to seek a *lis pendens* suspension."[466]

447. In support of its submission to dismiss Ecuador's counterclaims, Perenco advanced three main arguments:

> "(1) satisfaction of the joint and several counterclaims liability extinguishes Perenco's underlying obligation to Ecuador…; (2) Ecuador's identical counterclaims in these proceedings are moot because there is no dispute for this tribunal to decide; and (3) Ecuador's counterclaims are res judicata because the Burlington CC Decision [i.e. the Burlington Decision on Counterclaims] is no longer subject to any uncertainty, and continuing to litigate them would be an abuse of process."[467]

448. Perenco argues that "Burlington's payment of the Consortium's counterclaims liability satisfies and extinguishes the joint debt so that, as a matter of law, Ecuador cannot continue to pursue Perenco on that debt."[468] Perenco contends on the basis of the applicable Ecuadorian law that a joint and several liability is extinguished for all of the joint debtors when one debtor satisfies that liability.[469] According to Perenco, Ecuador has now received

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463 Reply, paragraph 9.
464 *Ibid.*, paragraph 10.
465 *Ibid.*, paragraph 12.
466 *Ibid.*, paragraph 13.
467 Second Dismissal Application, paragraph 20.
468 *Ibid.*, paragraph 22.
469 *Ibid.*, paragraphs 23-29.

full satisfaction with respect to the counterclaims.[470] Relying on Annex 3 of the Settlement Agreement, Perenco alleges that Ecuador "accepted that the payment represented 'the principal amount and the applicable interest' ordered by the *Burlington* tribunal, that it was paid 'as the full and final settlement of the environment and infrastructure counterclaims presented by Ecuador against Burlington[,]' and that by doing so '*all obligations and liabilities related to the Counterclaims* against Burlington and the Decision on the Counterclaims shall be deemed to have been *irrevocably, fully and finally paid, discharged, and satisfied*.'"[471]

449. Perenco emphasises that Ecuador presented the same claims, obligations and liabilities to both the *Perenco* and *Burlington* tribunals on the basis that Perenco and Burlington were jointly and severally liable.[472] Perenco asserts that "Ecuador has now received what it acknowledges to be full satisfaction of the obligation it asserted against Burlington" and "that obligation is necessarily the same as the obligation it asserted against Perenco."[473] Perenco adds in this respect that the fact "that the factual records before the *Perenco* and *Burlington* tribunals diverge in some respects does not mean the underlying obligations are legally distinct."[474] Furthermore, Perenco maintains that Ecuador expressly claimed the total amount of damages from each of Burlington and Perenco and not the aliquot share.[475] In addition, Perenco emphasises that "the possibility that the *Perenco* Tribunal … might ultimately determine higher or lower quantification of the counterclaims damages is irrelevant", because "the obligation on which those damages were premised has been satisfied and extinguished."[476] Perenco stresses that "Ecuador has been satisfied not just for the 'amounts' the *Burlington* tribunal calculated, but also for the underlying damage or

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470 *Ibid.*, paragraph 30.

471 *Ibid.* citing Annex 3, Settlement Agreement, CE-CC-431, p. 2, WHEREAS (2) and p. 4, paragraph 2 (emphasis in the original).

472 Second Dismissal Application, paragraphs 33-35; also Reply, paragraphs 17-19.

473 Second Dismissal Application, paragraph 36.

474 Reply, paragraph 23.

475 Second Dismissal Application, paragraphs 37-40.

476 *Ibid.*, paragraph 41.

harm; and not just for the obligations and liabilities the *Burlington* tribunal specified in its Decision on the Counterclaims, but for the counterclaims themselves."[477]

450. In its Reply, Perenco responds to Ecuador's argument that "Perenco was not a signatory to the Settlement Agreement and that Burlington's payment can have no effect on Perenco."[478] Perenco contends that "the operation of satisfaction as a matter of Ecuadorian law does not depend on, or result from, the content or existence of Annex 3", because "the obligation was extinguished through full payment, by operation of law."[479] In addition to the arguments put forward in its Second Dismissal Application, Perenco alleges that "[t]here would…be no point in acknowledging that Burlington would seek 'contribution', or in Perenco disclosing the Annex to its Tribunal, if Burlington's payment to Ecuador was just for its own distinct liability."[480]

451. According to Perenco's interpretation, the provision relied upon by Ecuador "allows joint debtors to settle their own share of a joint and several liability and provides that such a settlement would be binding between its signatories only."[481] However, Perenco contests the applicability of this rule in this case in which "Ecuador did not 'settle' Burlington's aliquot share of the environmental harm with Burlington", but "Burlington paid Ecuador… *full reparation* for the environmental harm claimed against the Consortium."[482] Perenco asserts that Ecuador "was prevented [by the Ecuadorian Constitution] from 'settling' with Burlington for anything other than 'full reparation' for the joint and several liability" allegedly according to Ecuador's own admission.[483] Perenco, furthermore, rejects the view that Ecuadorian law does not recognise the notion of mutual representation, pointing in this regard to a provision stipulating that "by virtue of an agreement, a will or the law, the full

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477 *Ibid.*, paragraph 44 citing Annex 3, CE-CC-431, p. 4, paragraph 2.
478 Reply, paragraph 27 referring to Response, paragraphs 95, 97, 100.
479 Reply, paragraph 28.
480 *Ibid.*, paragraph 37 citing Annex 3, CE-CC-431, p. 3, paragraph 5.
481 Reply, paragraph 32 referring to Ecuadorian Civil Code, EL-390, Article 2363.
482 Reply, paragraph 32 (emphasis in the original).
483 *Ibid.*, paragraph 33.

debt can be sought from any one of the debtors and by any one of the creditors; in that case, the obligation is *solidaria* or *in solidum*."[484]

452. Perenco maintains that "the satisfaction of Perenco's and Burlington's counterclaims liability also makes Ecuador's counterclaims in this arbitration moot."[485] Perenco refers to the case law of the International Court of Justice in which the Court has declined to give judgment in cases where "circumstances that have since arisen render any adjudication devoid of purpose", or the "dispute has disappeared because the object and purpose of the claim has been achieved by other means."[486] Perenco alleges that this Tribunal recognised mootness as a separate and independent basis on which to dismiss Ecuador's counterclaims, but refrained from doing so because the *Burlington* Decision on Counterclaims was at the time subject to annulment proceedings.[487] Perenco contends that this is not the case any longer as "[t]here is simply no question about…the final settlement of Ecuador's counterclaims."[488]

453. Perenco states that the fact that "Ecuador believes the *Burlington* tribunal should have awarded more damages is not a dispute to be adjudicated."[489] According to Perenco, "[m]ootness is assessed objectively as to the dispute, not the particular form of relief ultimately obtained."[490] In support of this claim, Perenco suggests that in the *Nuclear Tests* cases "the dispute had disappeared, since the object of the claim had effectively been accomplished by 'other means' than the relief requested."[491] It also maintains that, in those

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484 *Ibid.*, paragraph 34 citing Article 1527, Ecuadorian Civil Code, CA-CC-128.

485 Second Dismissal Application, paragraph 49.

486 *Ibid.*, paragraph 53 citing *Northern Cameroons, Judgment of 2 December 1963, I.C.J. Reports 1963*, p. 38; *Nuclear Tests (Australia v. France), Judgment of December 20, 1974, I.C.J. Reports 1974*, pp. 270-271, paragraph 55.

487 Second Dismissal Application, paragraphs 49-50 referring to the Tribunal's Decision on Perenco's First Dismissal Application.

488 *Ibid.*, paragraphs 50-52.

489 *Ibid.*, paragraph 54.

490 *Id.*

491 *Ibid.* paragraph 55 citing *Nuclear Tests (New Zealand v. France), Judgment of 20 December 1974, I.C.J. Reports 1974*, paragraph 58; *Nuclear Tests (Australia v. France), Judgment of 20 December 1974, I.C.J. Reports 1974*, paragraph 55.

cases, "the fact that the *applicants* did not consider the dispute concluded '[did] not prevent the Court from making its own independent finding on the subject.'"[492] Perenco further suggests that the reasoning of the *Orascom* award is instructive for the application of the principle in the investor-State arbitral context.[493]

454. In its Reply, Perenco underlines that the mootness doctrine is not limited only to cases in which the requested relief is specific performance.[494] Perenco places particular emphasis on the *Orascom* award. The claimant in that case "sought damages, not specific performance" and "the tribunal nevertheless dismissed the claims…because the 'claims arising from Algeria's measures have ceased to exist due to the settlement agreement' between a claimant-controlled company and Algeria."[495]

455. Perenco submits that "Ecuador's counterclaims are also *res judicata* because of the now unequivocal finality of" the *Burlington* Decision on Counterclaims.[496] Perenco asserts that "*res judicata* precludes re-litigation of the same dispute" and "applies to privies of the parties to the dispute."[497] Perenco asserts that this Tribunal "recognized that the *Burlington* Award was formally *res judicata*", but denied Perenco's First Application "because of the uncertainty about [its] finality…pending annulment."[498] It furthermore contends that "there can be no residual argument that Perenco waived *res judicata* by failing to earlier raise *lis pendens*."[499]

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492 Second Dimissal Application, paragraph 55 citing *Nuclear Tests (New Zealand v. France), Judgment of 20 December, 1974, I.C.J. Reports 1974*, paragraph 62; *Nuclear Tests (Australia v. France), Judgment of 20 December 1974, I.C.J. Reports 1974*, paragraph 59.

493 Second Dismissal Application, paragraph 57 referring to *Orascom TMT Investments S.à.r.l v. People's Democratic Republic of Algeria*, Award, ICSID Case No. ARB/12/35, 31 May 2017, paragraphs 488, 492-494, 518-520, 524-526.

494 Reply, paragraph 40 referring to Response, paragraph 95.

495 Reply, paragraph 41 citing *Orascom TMT Investments S.à.r.l v. People's Democratic Republic of Algeria*, ICSID Case No. ARB/12/35, Award, 31 May 2017, paragraph 524.

496 Second Dismissal Application, paragraph 59.

497 *Ibid.*, paragraph 60.

498 *Ibid.*, paragraph 62.

499 *Ibid.*, paragraph 64.

456. In its Reply, Perenco rejects Ecuador's contention that *res judicata* is inapplicable because the party identity requirement is not met.[500] Perenco relies on the *Grynberg*, *Apotex III*, and *Ampal-American* awards to argue that "*res judicata* applies to privies or other stakeholders."[501] Contrary to Ecuador's allegations, Perenco adds that privity does not require ownership, even if the principle has been applied so far only in the specific context of a shareholder-parent company relationship.[502] Perenco asserts that "privity exists when two entities share an identity of interest that means they equally stand to benefit or suffer economically as a result of an outcome."[503] According to Perenco, such an identity of interests exists between Perenco and Burlington.[504]

457. Perenco also denies Ecuador's argument that dismissing Ecuador's counterclaims on the grounds of *res judicata* would imply revisiting and reversing the Tribunal's 2015 Interim Decision.[505] According to Perenco, "[t]he Tribunal would not need to incorporate inconsistent findings or in any way prejudice its Interim Decision", but it would only decide that the *Burlington* Decision on Counterclaims "has preclusive effect as of the time it became *res judicata*."[506]

458. Perenco also takes issue with Ecuador's supplementary request to the Tribunal to apply by analogy Article 51(1) of the ICSID Convention and analyse evidence that was not taken into consideration by the *Burlington* tribunal.[507] Perenco argues that Article 51(1) of the

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500 Reply, paragraphs 44 and 46 referring to Response, paragraph 66.

501 Reply, paragraph 45 referring to *Rachel S. Grynberg, Stephen M. Grynberg, Miriam Z. Grynberg and RSM Production Corporation v. Grenada*, ICSID Case No. ARB/10/6, Award, 10 December 2010, paragraphs 7.1.5 and 7.2.1; *Apotex Holdings Inc. and Apotex Inc. v. United States of America*, ICSID Case No. ARB(AF)/12/1, Award, 25 August 2014, paragraphs 7.38 and 7.40; *Ampal-American Israel Corp., EGI-Fund (08-10) Investors LLC, EGI-Series Investments LLC, and BSS-EMG Investors LLC v. Arab Republic of Egypt*, ICSID Case No. ARB/12/11, Award, paragraphs 268-270.

502 Reply, paragraph 47.

503 *Ibid.*

504 *Ibid.*, paragraphs 48-50.

505 *Ibid.*, paragraphs 51- 52 referring to Response, paragraphs 56-58.

506 Reply, paragraph 52.

507 *Ibid.*, paragraphs 51 and 53.

ICSID Convention does not allow "reviving a liability that has already been extinguished" and, in any case, "such argument lies before the *Burlington* tribunal, not this one."[508]

459. Perenco further contends that "even if this Tribunal were to find that some formal requirement of the doctrine of *res judicata* is not met, the doctrine of abuse of process would still apply."[509] According to Perenco, decisions of other tribunals support the view that the doctrine of abuse of process precludes "pursuing duplicative claims for a dispute that has already been resolved."[510]

460. In its Reply, even though Perenco concedes the point that Ecuador had the right to commence proceedings in multiple *fora*, it stresses that "it would be an abuse of that right to *continue* to pursue those parallel proceedings after Ecuador has obtained full satisfaction and payment."[511] Furthermore, it claims that there is no support to Ecuador's argument that "abuse of process may only occur when multiple proceedings are brought between the *same parties*."[512] In addition, Perenco maintains that it is not necessary to establish that the "sole purpose for continuing Ecuador's counterclaims would be to harm Perenco."[513] Perenco suggests that multiplication of proceedings could also constitute an abuse of process when it is done "for the purpose of evading a rule of law" or "in order to maximize its chances of success."[514]

461. In the alternative, if the Tribunal proceeds to the merits of Ecuador's claims, Perenco submits that the Tribunal should "offset Burlington's entire US$42 million payment against

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508 *Ibid.*, paragraph 53.

509 Second Dismissal Application, paragraph 65.

510 *Ibid.*, citing *Eskosol S.p.A in liquidazione v. Italian Republic*, ICSID Case No. ARB/15/50, Decision on Respondent's Application under Rule 41(5), March 20, 2017, paragraphs 134 and 167; *Ampal-American Israel Corp., EGI-Fund (08-10) Investors LLC, EGI-Series Investments LLC, and BSS-EMG Investors LLC v. Arab Republic of Egypt*, ICSID Case No. ARB/12/11, Decision on Jurisdiction, 1 February 2016, paragraph 331; *Orascom TMT Investments S.à.r.l v. People's Democratic Republic of Algeria*, ICSID Case No. ARB/12/35, Award, 31 May 2017, paragraph 534.

511 Reply, paragraph 57 (emphasis in the original) referring to Response, paragraph 78.

512 *Ibid.*, paragraph 59 citing Response, paragraph 78 (emphasis in the original).

513 *Ibid.*, paragraph 63 citing Response, paragraph 81.

514 *Ibid.*, paragraph 63.

the total amount of any counterclaim damages this Tribunal might find."[515] According to Perenco, the approach proposed by Ecuador is conceptually inappropriate, because "the *Burlington* tribunal awarded, and Burlington paid, the total amount of damages for the entirety of the alleged harm."[516] Moreover, Perenco suggests that the method proposed by Ecuador would lead to double recovery and is technically not feasible.[517] In its Reply, Perenco objects to Ecuador's arguments for the same reasons.[518]

462. Perenco also rejects Ecuador's objections to its request for an order of the Tribunal that would hold Perenco harmless against any future claims based on alleged environmental and infrastructure liability arising out of Blocks 7 and 21.[519] Perenco denies that its request would require this Tribunal to assume jurisdiction over third parties or subject-matters not encompassed by Ecuador's counterclaims.[520] It also rejects the contention that its request is abusive.[521] Contrary to Ecuador's allegation that the request is untimely, Perenco argues that it sought a similar relief in its Rejoinder on the Counterclaims.[522] In the alternative, Perenco requests that "the Tribunal should exercise its discretionary powers under the Arbitration Rules to consider and grant Perenco's request…even if ICSID Rule 40 applies here and somehow makes Perenco's request untimely."[523]

463. In its Second Dismissal Application, Perenco seeks an order from the Tribunal:

> "(a) Dismissing Ecuador's counterclaims:
>
> (b) In the alternative:
>
> (i) Deducting US$42,762,619 (the "Payment) from any damages it may find on Ecuador's counterclaims in this proceeding (the "Gross Counterclaims Amount"), including issuing an order for zero damages if the Gross Counterclaims Amount is lower than the Payment, such that any damages Perenco is ordered to pay on

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515 Second Dismissal Application, paragraph 68.

516 *Ibid.*, paragraph 70; see also Reply, paragraph 66.

517 Second Dismissal Application, paragraphs 73-77.

518 Reply, paragraphs 66-72.

519 *Ibid.*, paragraphs 73-75 referring to Response, paragraphs 175 *ff.*

520 Reply, paragraph 73.

521 *Ibid.*, paragraphs 74-75.

522 *Ibid.*, paragraph 76.

523 *Ibid.*

Ecuador's counterclaims (the "Net Counterclaims Amount") do not exceed the higher of the Payment or the Gross Counterclaims Amount;

(ii) Declaring that Perenco has no further liability with respect to Ecuador's counterclaims beyond the Net Counterclaims Amount;

(iii) Further ordering that Perenco may satisfy the Net Counterclaims Amount by deducting it from the amount that Ecuador owes to Perenco under this Tribunal's final Award; and

(iv) Otherwise conditioning the above order on obtaining satisfactory guarantees from Ecuador that it will not enforce this Tribunal's final Award, the *Burlington* Award, or the Payment cumulatively, whether by offset or otherwise, such that the net Counterclaims Amount is the full amount that Ecuador can recover against both or either of Perenco and Burlington with respect to the counterclaims against each of them; and

(c) Ordering that Ecuador hold Perenco harmless against any future claims based on alleged environmental and infrastructure liability arising out of Blocks 7 and 21, before any jurisdiction whatsoever, whether arbitral or judicial, national or international; and

(d) Ordering Ecuador to pay all the costs of the arbitration, as well as Perenco's fees and expenses, for the counterclaims phase of these proceedings."[524]

464. In its Reply, Perenco seeks an order from the Tribunal:

"(a) Dismissing Ecuador's counterclaims;

(b) In the alternative:

(i) Deducting US$42,762,619 (the "Payment) from any damages it may find on Ecuador's counterclaims in this proceeding (the "Gross Counterclaims Amount"), including issuing an order for zero damages if the Gross Counterclaims Amount is lower than the Payment, such that any damages Perenco is ordered to pay on Ecuador's counterclaims (the "Net Counterclaims Amount") do not exceed the higher of the Payment or the Gross Counterclaims Amount;

(ii) Declaring that Perenco has no further liability with respect to Ecuador's counterclaims beyond the Net Counterclaims Amount;

(iii) Further ordering that Perenco may satisfy the Net Counterclaims Amount by deducting it from the amount that Ecuador owes to Perenco under this Tribunal's final Award; and

(iv) Otherwise conditioning the above order on obtaining satisfactory guarantees from Ecuador that it will not enforce this Tribunal's final Award, the Burlington Award, or the Payment cumulatively, whether by offset or otherwise, such that the net

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524 Second Dismissal Application, paragraph 79.

Counterclaims Amount is the full amount that Ecuador can recover against both or either of Perenco and Burlington with respect to the counterclaims against each of them; and

(c) Ordering that Ecuador hold Perenco harmless against any future claims based on alleged environmental and infrastructure liability arising out of Blocks 7 and 21, before any jurisdiction whatsoever, whether arbitral or judicial, national or international; and

(d) Ordering Ecuador to pay all the costs of the arbitration, as well as Perenco's fees and expenses, for the counterclaims phase of these proceedings.[525]"

2. Ecuador's Arguments

465. Ecuador requests the Tribunal to dismiss Perenco's Second Dismissal Application for several reasons.[526]

466. Ecuador argues that Perenco is barred from relying on its objections, because they are untimely.[527] Ecuador maintains that, according to ICSID Arbitration Rules 41(1), 26(3) and 27, "objections shall be made as early as possible; if not, the practice is to dismiss them outright."[528] Ecuador points out that Perenco should have invoked *lis pendens* when Ecuador first introduced its counterclaims.[529] In Ecuador's opinion, the fact that Perenco's objections were presented more than six years after the introduction of Ecuador's counterclaims should be considered a waiver of these objections.[530] According to Ecuador, Perenco is also precluded from requesting the dismissal of Ecuador's counterclaims on account of estoppel.[531] Ecuador argues that it relied on Perenco's participation in the counterclaims proceedings without raising any objections and, as a result, Ecuador "invest[ed] considerable time and public funds to establish Perenco's liability in the understanding that it would be adjudicated by this Tribunal."[532] In its Rejoinder, Ecuador

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525 Reply, paragraph 77.

526 Response, paragraph 48.

527 *Ibid.*, paragraph 54.

528 *Ibid.*, paragraph 55; see also Rejoinder, paragraph 51.

529 Response, paragraph 55.

530 *Ibid*.

531 *Ibid.*, paragraph 93; see also Rejoinder, paragraph 52.

532 Rejoinder, paragraph 55.

stresses that Perenco's failure to raise *lis pendens*, request a stay of the proceedings or the consolidation of the counterclaims is also abusive.[533]

467. Ecuador further contends that Perenco's objections are barred on the ground of *res judicata*. In particular, Ecuador claims that the *Burlington* Decision on Counterclaims is incompatible with this Tribunal's Interim Decision on Counterclaim in which it made a number of legal and factual determinations on Ecuador's environmental counterclaim and thus constitutes *res judicata*.[534] According to Ecuador, "holding that the *Burlington* Decision on Counterclaims is *res judicata* would go against the widely established principle that it is the first decision rendered on an issue that is *res judicata*."[535] Ecuador further observes that these arguments have been espoused by the Tribunal in its previous decisions.[536]

468. Ecuador submits that the finality of the *Burlington* Decision on Counterclaims does not render its counterclaims moot,[537] as the requirements of *res judicata* are not met in this case.[538] Ecuador concedes that the Tribunal's Decision on Perenco's First Dismissal Application found that that application was premature in light of the then-pending annulment proceedings concerning the *Burlington* Decision on Counterclaims.[539] However, Ecuador stresses that the Tribunal only considered such proceedings "a bar to a hypothetical argument…which the Tribunal only mentioned without approving it; namely, that the case was moot."[540]

469. Ecuador argues that neither Perenco nor the Consortium were parties to the *Burlington* arbitration.[541] Ecuador emphasises that Burlington and Perenco are legally and

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533 *Ibid.*, paragraphs 42-49.
534 Response, paragraph 57; Rejoinder, paragraph 60.
535 Response, paragraph 58; also Rejoinder, paragraph 63.
536 Response, paragraphs 57-58 citing Decision on Perenco's First Application, paragraphs 36 and 40-42.
537 Response, paragraph 49.
538 *Ibid.*, paragraph 61.
539 *Ibid.*, paragraph 50.
540 *Ibid.*, referring to Decision on Perenco's First Dismissal Application, paragraph 46.
541 Response, paragraph 63.

economically independent entities.[542] According to Ecuador, "the party identity requirement is applied strictly under both international law and Ecuadorian law", so that "privies in interest cannot be considered the same parties for the purposes of a *res judicata* analysis."[543]

470. Ecuador claims in the alternative that Burlington and Perenco are not privies in interest, since "privity only exists when one party owns the other."[544] In its Rejoinder, Ecuador emphasises that the three tribunals in *Grynberg*, *Apotex III* and *Ampal-America* – upon whose decisions Perenco relies – "decided to extend the *res judicata* effect to the shareholders on the basis that, as shareholders are entitled to claim for investments held through a corporation under investment law, they must be bound by any previous finding reached in relation to a claim of this corporation on the same facts."[545] According to Ecuador, this rationale cannot be extended to parties that share the same economic interest in the outcome of a dispute as proposed by Perenco.[546]

471. Ecuador submits that there is no identity of subject-matter between these proceedings and the *Burlington* proceedings. Ecuador notes in this respect a passage in the *Burlington* Decision on Counterclaims in which that tribunal indicated that "*it reache[d] a conclusion different from that of the Perenco tribunal*."[547] Ecuador observes that there are "material differences in the evidentiary records before the *Burlington* tribunal and this Tribunal" consisting of differences "in the evidence relied upon" and "in the witnesses as well as in the questions put to the witnesses and experts during the hearings and the *Burlington* tribunal's site-visit where those experts and witnesses were the same."[548] Ecuador asserts that "the different evidentiary record translated, in turn, into radically different approaches

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542 *Ibid.*, paragraph 62.

543 *Ibid.*, paragraph 66.

544 *Ibid.*, paragraph 67.

545 Rejoinder, paragraph 114.

546 *Ibid.*, paragraphs 115-117.

547 Response, paragraph 33 citing *Burlington* Decision on Counterclaims, paragraph 69.

548 Response, paragraph 69; also *ibid.*, paragraphs 9-47 and Rejoinder, paragraphs 8-34.

by the tribunals."[549] Ecuador draws the Tribunal's attention, *inter alia*, to the fact that the two tribunals "adopted distinct approaches as to how the extent of the contamination and the obligation to remediate should be assessed."[550] It also observes that the *Burlington* tribunal decided to rely on party-appointed experts and a site visit, whereas the present Tribunal decided to appoint its own independent environmental expert.[551] In its Rejoinder, Ecuador contends that, contrary to Perenco's claims, "when two separate tribunals analyze different evidence presented in different manners, they do not consider the same facts and, hence, they decide on different subject-matters."[552]

472. In the event that the Tribunal finds that the *Burlington* Decision on Counterclaims is final and binding in the present proceedings, Ecuador requests the Tribunal to apply by analogy Article 51(1) of the ICSID Convention on revision of awards in order "to pursue its mission and analyze the new evidence before it, which was not taken into consideration by the *Burlington* tribunal when rendering [its] Decision."[553]

473. In its Rejoinder, Ecuador stresses that the site-specific data and analytical results gathered by Mr. MacDonald constitute a "new potentially decisive fact."[554] Ecuador agrees with Perenco that Article 51(1) of the ICSID Convention would have entitled the *Burlington* tribunal to revise its Decision on Counterclaims, but this rationale applies *a fortiori* before this Tribunal while this arbitration is still pending.[555] Ecuador further argues that it would be entitled to institute proceedings under Article 51(1) of the ICSID Convention, were this Tribunal to uphold Perenco's Application.[556] To this end, Ecuador requests that

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549 Response, paragraph 23.

550 *Ibid.*, paragraph 71; see also Rejoinder, paragraph 120.

551 Response, paragraph 71.

552 Rejoinder, paragraphs 125-126 citing *CME Czech Republic B.V. v. The Czech Republic*, UNCITRAL, Final Award, 14 March 2003, paragraph 432.

553 Response, paragraphs 73-75.

554 Rejoinder, paragraphs 137-139.

555 *Ibid.*, paragraph 140.

556 *Ibid.*, paragraph 141.

Mr. MacDonald's Independent Expert Report be communicated to it, even if the Tribunal ultimately accepts Perenco's Application.[557]

474. Ecuador rejects Perenco's submission that its counterclaims constitute an abuse of process. Ecuador contends that the doctrine of abuse of process is inapplicable in this case for several reasons. First, Perenco should establish that the sole purpose of continuing Ecuador's counterclaims would be to harm Perenco or would be otherwise vexatious which is not the case in the present proceedings.[558] Relying on the *Lauder* and *Busta* awards, Ecuador asserts further that pursuing parallel proceedings with a view to maximising its chances of success does not constitute an abuse of process.[559] Ecuador adds that the cases cited by Perenco suggest that "the dispute must be brought by the same claimant against the same respondent" for an abuse to be found.[560] In Ecuador's view, the *Orascom* and *Ampal-American* tribunals deemed that companies at different levels of the same ownership chain were the same party, whereas the *Eskosol* tribunal's approach was even narrower, the tribunal holding that two companies of the same ownership chain were distinct parties.[561]

475. Ecuador rejects Perenco's claim that Ecuador's counterclaims are moot, arguing that Perenco's reliance on mootness is inapposite because all the pronouncements cited by Perenco related to cases "where specific performance is requested in order to prevent the

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557 *Id.*

558 Response, paragraphs 81-82; Rejoinder, paragraphs 104-108.

559 Response, paragraphs 83-85 referring to *Lauder v. Czech Republic, UNCITRAL*, Final Award, 3 September 2001, paragraph 177 and *Ivan Peter Busta and James Peter Busta v. Czech Republic*, SCC Case No. V 2015/014, Final Award, 10 March 2017, paragraph 211; also Rejoinder, paragraphs 104-105.

560 Response, paragraph 87.

561 *Ibid.*, referring to *Orascom TMT Investments S.à.r.l v. People's Democratic Republic of Algeria*, ICSID Case No. ARB/12/35, Award, 31 May 31 2017, paragraphs 494-495; *Ampal-American Israel Corp., EGI-Fund (08-10) Investors LLC, EGI-Series Investments LLC, and BSS-EMG Investors LLC v. Arab Republic of Egypt*, ICSID Case No. ARB/12/11, Decision on Jurisdiction, 1 February 2016, paragraph 331; *Eskosol S.p.A in liquidazione v. Italian Republic*, ICSID Case No. ARB/15/50, Decision on Respondent's Application under Rule 41(5), 20 March 2017, paragraphs 168-169; also Rejoinder, paragraphs 100-101.

occurrence of harm and, either the harm occurred in the meantime, or the responding party voluntarily complied."[562]

476. Ecuador contends that Perenco's liability is not extinguished under Ecuadorian law.[563] In its Rejoinder, Ecuador takes issue with Perenco's argument that the quantification of damages is a conceptually distinct issue from the existence of the liability itself.[564] According to Ecuador, "tort liability…depends on the extent of the harm suffered."[565] Ecuador emphasises that the present Tribunal "is entrusted with determining the extent of the harm to establish the extent of Perenco's liability" in contrast to the *Burlington* tribunal whose mandate was limited to the determination of the extent of Burlington's liability.[566]

477. In Ecuador's view, the notion of mutual representation is alien to the Ecuadorian joint and several liability legal regime.[567] Ecuador claims that it was entitled to sue Burlington, Perenco, or both.[568] Furthermore, Ecuador suggests that the non-extinction of Perenco's debt can be inferred from the fact that the victim/creditor can commence one or several proceedings against its co-debtors under Ecuadorian law.[569]

478. In its Rejoinder, Ecuador maintains that Perenco's reliance on the Ecuadorian joint and several liability regime is misplaced, since the effect of full payment by one co-debtor with respect to the other co-debtors is not disputed.[570] According to Ecuador, the issue is "whether the first-in-time decision of one tribunal is or is not binding on the other tribunal and renders or does not render the second-in-time proceedings moot…when parallel proceedings are commenced and pursued against different co-authors."[571] In this respect,

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562 Response, paragraph 95.
563 *Ibid.*
564 Rejoinder, paragraph 71.
565 *Ibid.*, paragraph 77.
566 *Id.*
567 Response, paragraphs 97-103.
568 *Ibid.*, paragraph 96.
569 *Ibid.*, paragraphs 104 and 106.
570 Rejoinder, paragraph 85.
571 *Id.*

Ecuador reiterates that this Tribunal has established its own criteria for the determination of the extent of damage for which Perenco will be held liable and the fact that the both proceedings have materially different evidentiary records.[572] It also points out that the *Burlington* Settlement Agreement does not envisage the termination of the *Perenco* proceedings by providing, *inter alia*, that Ecuador will not seek double recovery in these proceedings.[573]

479. Ecuador places particular emphasis on a provision of the Ecuadorian Civil Code which stipulates that "[a] settlement is binding between its signatories only. Where there are several co-debtors who may have an interest in the settlement, the settlement made by one of them cannot be enforced by or against the others, except where there is novation and the underlying obligation is joint and several."[574] Ecuador submits that Perenco is not bound by the *Burlington* proceedings nor by the *Burlington* settlement.[575] In its Rejoinder, Ecuador adds that the *Burlington* Settlement Agreement cannot benefit Perenco, because "[f]or a settlement to exist, the parties must make reciprocal concessions."[576] In particular, Ecuador alleges that "the set off of the damages awarded against Burlington for the environmental and infrastructure harms" was part of a larger settlement including a discount to the amount owed by Ecuador as a result of the *Burlington* award and the termination of the *Burlington* proceedings.[577]

480. Ecuador also requests the Tribunal to dismiss Perenco's request to offset the entirety of Burlington's payment from any counterclaims' damages awarded by the Tribunal. Whilst Ecuador agrees to avoid double recovery, it maintains that Perenco's approach is flawed.[578] According to Ecuador, "[t]he risk of double recovery can only materialize…if the Tribunal finds exactly the 'same harm' as the one identified and quantified by the *Burlington* tribunal

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572 *Ibid.*, paragraphs 86-90.

573 *Ibid.*, paragraph 92.

574 Response, paragraph 100 citing Article 2363, Ecuadorian Civil Code, EL-390.

575 Response, paragraph 97.

576 Rejoinder, paragraph 69.

577 *Id.*

578 Response, paragraphs 109-111.

pursuant to its own (different) interpretation of the legal framework and technical methods."[579] Ecuador suggests that "'[s]ame loss' (or 'same harm' in the circumstances) requires that both tribunals assess the object of the underlying obligation in an identical manner."[580]

481. Ecuador does not dispute that some part of the harm could be the same as that identified by the *Burlington* tribunal, but argues that it remains entitled to claim for "any…different or additional harm and/or costs with respect to the environment and infrastructure in Blocks 7 and 21."[581] Ecuador contends that Perenco remains liable for any additional and/or different volumes of soil, mud pits, and groundwater contamination warranting remediation and/or additional remediation costs in Blocks 7 and 21.[582] With respect to infrastructure harm, Ecuador claims that Perenco remains liable for any additional item and/or additional cost identified in Blocks 7 and 21.[583]

482. In its Rejoinder, Ecuador defends the technical feasibility of its approach. It stresses that Perenco did not challenge the feasibility of Ecuador's approach with respect to the infrastructure counterclaim.[584] With respect to its environmental counterclaim, Ecuador further argues that its approach can be applied where Mr. MacDonald finds contamination in clearly distinct areas or sites from that identified by the *Burlington* tribunal or where the depth of contamination can be discerned through a comparison between Mr. MacDonald's findings with respect to the contaminated area and the *Burlington* tribunal's findings with respect to the volume to be remediated.[585] Ecuador also proposes that in the cases where the exact shape of the contaminated area is not delineated in the *Burlington* Decision on Counterclaims, the Tribunal "could compare abstract square meters of contamination (not

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579 *Ibid.*, paragraph 118.
580 *Ibid.*, paragraph 117.
581 *Ibid.*, paragraphs 119 and 121.
582 *Ibid.*, paragraphs 122-170.
583 *Ibid.*, paragraphs 171-173.
584 Rejoinder, paragraph 150.
585 *Ibid.*, paragraphs 155-156.

monetary damages) found at the same depth, deduct the overlap, and apply the remediation unit cost estimated by Mr. MacDonald to the balance."[586]

483. Ecuador further requests the Tribunal to reject Perenco's request for an order that "Ecuador hold Perenco harmless against any future claims based on alleged environmental and infrastructure liability arising out of Blocks 7 and 21, before any jurisdiction whatsoever."[587] Ecuador maintains that this request is unrelated to the application, because "[w]hether or not Ecuador's counterclaims must be dismissed in the present arbitration does not have any consequences on, or relationships with, potential future claims against Perenco, including by third parties, based on environmental and infrastructure liability arising out of Blocks 7 and 21."[588] Ecuador contends that Perenco is barred for presenting such a request at this phase of the proceedings, since it has not previously sought the authorisation of the Tribunal in accordance with ICSID Arbitration Rule 40(2).[589] Ecuador emphasises that Perenco cannot invoke any special circumstance for its belated presentation of this request for relief.[590] It adds that Perenco's request for relief is unfounded, because Ecuador cannot assume responsibility for claims that may arise from third parties.[591] For the same reason, Ecuador submits that the Tribunal lacks jurisdiction to grant such an order.[592] Ecuador argues that this request is also abusive, because it is inconsistent with the other requests formulated in Perenco's Second Dismissal Application.[593]

484. In its Response, Ecuador requests the Tribunal to:

"(a) Dismiss Perenco's Second Application;

(b) Dismiss Perenco's alternative requests for relief;

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586 *Ibid.*, paragraph 162.
587 Response, paragraph 175.
588 *Ibid.*, paragraph 177.
589 *Id.*
590 Rejoinder, paragraphs 172-173.
591 Response, paragraph 178; Rejoinder, paragraphs 179-183.
592 Response, paragraph 179.
593 *Ibid.*, paragraphs 180-181.

(c) Dismiss Perenco's request that Ecuador hold Perenco harmless against any future claims based on alleged environmental and infrastructure liability arising out of Blocks 7 and 21, before any jurisdiction whatsoever arbitral or judicial, national or international; and

(d) Order Perenco to reimburse Ecuador all the costs and expenses incurred in responding to Perenco's Second Application, with interest."[594]

485. In its Rejoinder, Ecuador amended its request. It requests that the Tribunal:

"(a) Dismiss Perenco's Second Application;

(b) Dismiss Perenco's alternative requests for relief;

(c) Dismiss Perenco's request that Ecuador hold Perenco harmless against any future claims based on alleged environmental and infrastructure liability arising out of Blocks 7 and 21, before any jurisdiction whatsoever arbitral or judicial, national or international;

(d) Communicate Mr. MacDonald's expert report, including its exhibits, appendices and all supporting data (in native format) to the Parties; and

(e) Order Perenco to reimburse Ecuador all the costs and expenses incurred in responding to Perenco's Second Application, with interest."[595]

3. Tribunal's Reasons for Rejecting Perenco's Second Dismissal Application

486. As noted above, the Tribunal, by a majority, rejected Perenco's Second Dismissal Application. The reasons are as follows.

487. The Second Dismissal Application raises issues of both Ecuadorian and international law. The latter argue in favour of the Tribunal's continuing the counterclaim proceeding. As for the former, a review of the Parties' submissions shows that the position under Ecuadorian law is not as clear-cut as Perenco has contended.

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594 *Ibid.*, paragraph 183.

595 Rejoinder, paragraph 190.

488. The Tribunal begins by recalling that it held in the Decision on Reconsideration that its prior decisions are *res judicata* and cannot be re-opened.[596] This finding applies with equal force to the Interim Decision on Counterclaim; the Tribunal cannot reopen and reconsider its findings, either explicitly or implicitly.

489. Among the Tribunal's (explicit and implicit) findings in the Interim Decision on Counterclaim and the Decision on Perenco's First Dismissal Application were the following:

(a) The Tribunal had jurisdiction to entertain the counterclaim against Perenco even though a similar counterclaim was on track in the *Burlington* proceeding;[597]

(b) the counterclaim was not inadmissible;[598]

(c) the Tribunal decided with finality a number of issues pertaining to the interpretation of the Ecuadorian Constitution and the applicable environmental regulations and recommended that the Parties settle the dispute;[599]

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596 Decision on Reconsideration, paragraph 43: "There is ample prior authority in support of the view once the tribunal decides with finality any of the factual or legal questions put to it by the parties, as was the case in the Decision on Liability, such a decision becomes *res judicata*."

597 Decision on Perenco's First Dismissal Application, paragraph 44.

598 *Id.*, paragraphs 43 and 51.

599 Interim Decision on Counterclaim, paragraph 593: "Having regard to the Tribunal's findings in relation to: (i) background values; (ii) the temporal application of the 2008 Constitution to the facts of this case; (iii) the applicable standards under Ecuadorian law; (iv) the 2008 Constitution's variation of the limitations period; (v) the Tribunal's criticism of the narrowness of GSI's sampling practices; (vi) the Tribunal's rejection of IEMS' mapping and unit costs for remediation; and (vii) the fact the Tribunal will not permit the sampling of areas in the Blocks which were not previously sampled by either party's experts, the Tribunal believes that the remaining issues are most unlikely to lead to an award of damages anywhere near the amount claimed by Ecuador. The Parties will doubtless take all this into account as well as the considerable cost of the further enquiry which the Tribunal considers is absolutely necessary to arrive at a just result in the circumstances of this case in deciding whether it is possible for them to arrive at a mutually satisfactory resolution of this aspect of the dispute."

(d) the Tribunal did not find the expert evidence adduced by both Parties sufficiently reliable and accepted Perenco's argument that it would not be appropriate to 'pick and choose' between the experts in order to fashion relief;[600]

(e) the Tribunal refused to reject the claim on the basis of a failure to discharge the burden of proof, holding instead that in light of the Constitution's strong interest in environmental protection and in the interest of a just and fair result it would appoint an independent expert if the Parties were unable to negotiate a settlement. The Tribunal stated that it considered such "further enquiry [to be] absolutely necessary to arrive at a just result in the circumstances of this case";[601]

(f) it also explicitly instructed that: "If an agreement is not reached, the Tribunal will await the results of its expert's work and make a final decision which will be included in the Award";[602] and

(g) finally, the Tribunal stated, without qualification, that the Independent Expert Report would be disclosed to the Parties.[603]

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600 Interim Decision on Counterclaim, paragraph 585: "…the Tribunal agrees with Perenco that given the present state of the evidence it should not 'take as its task picking and choosing between the experts on each issue one by one, cafeteria-style' – because the Tribunal does not possess the requisite technical expertise to decide between experts' disagreements over highly technical issues – it is equally uncomfortable with simply picking one set of experts' conclusions over the other. The Tribunal well understands that the onus of proof is on a party who makes an allegation and it could be said that because of the doubt in which the Tribunal finds itself Ecuador could be said to have failed in tipping the burden in its favor. However, as the Tribunal is satisfied that there has been some damage for which it seems likely that Perenco is liable, the Tribunal is not disposed to dismiss the counterclaim *in limine*. Given the Constitution's embrace of the importance of the protection of the environment, the most accurate picture of the environmental condition of the Blocks possible – based on the prior sampling locations of both IEMS and GSI – must inform the Tribunal's decision on the counterclaim."

601 Interim Decision on Counterclaim, paragraph 593.

602 *Ibid.*, paragraph 594.

603 *Ibid.*, paragraph 20 of the *dispositif*: "The Tribunal will instruct the expert to move with all deliberate dispatch in order for the expert to be in a position to report back to it in a timely fashion. The Parties shall be given an opportunity to comment on the expert's report prior to the Tribunal's rendering a decision or award on this phase of the proceeding." [Emphasis added.]

490. Having failed to arrive at a negotiated settlement, the Parties jointly agreed on Mr. MacDonald's suitability as the Independent Expert and the Tribunal accepted their joint proposal. The Tribunal then instructed him on how to conduct his sampling.

(a) The international law analysis

491. From the foregoing, it can be seen that the Tribunal faces two *rei judicatae*: (i)) a decision rendered in this proceeding, which on the basis of the logic of the Decision on Reconsideration, and on general principle, is binding on Perenco and Ecuador; and (ii) a decision rendered in a parallel proceeding *after* the present Tribunal rendered its own Interim Decision on Counterclaim (that other decision being binding on Burlington and Ecuador). Perenco now requests that this Tribunal declare that the Ecuador-Burlington settlement following the *Burlington* award is binding upon the Parties to this proceeding. Perenco essentially contends that a *res judicata* created by a different tribunal, after this Tribunal had spoken, which award was subsequently reflected in a settlement between the parties to that dispute, overrides the *res judicata* created by the present Tribunal.

492. There are a number of troubling aspects to this argument.

493. First, from the standpoint of an international tribunal's duty to exercise its jurisdiction once established[604], it seems counter-intuitive that a tribunal that has made certain findings of law and fact and has decided that a particular course of action must be followed because of the infirmities of the expert evidence before it must be bound by the later finding of another tribunal considering similar issues (based on a different evidential record and in some cases deciding differently from this Tribunal) and which was less troubled by the infirmities in the expert evidence.

494. One can reasonably ask why the *res judicata* represented by the Interim Decision on Counterclaim of this Tribunal must yield to the *res judicata* of a later-in-time decision rendered by another tribunal that chose a different means of estimating the damage suffered

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604 *SGS Société Générale de Surveillance S.A. v. Islamic Republic of Pakistan*, ICSID Case No. ARB/01/13, Decision on Jurisdiction, 6 August 2003, paragraph 187. *Tokios Tokelès v. Ukraine*, ICSID Case No. ARB/02/18, Decision on Jurisdiction, 29 April 2004, paragraph 36, *The Rompetrol Group N.V. v. Romania*, ICSID Case No. ARB/06/3, Decision on Jurisdiction and Admissibility, 18 April 2008, paragraph 115.

by Ecuador (and which, when rendering its award, declined to give effect to this Tribunal's prior decision).

495. Second, the Tribunal sees the force in Ecuador's argument that given the procedure which the Tribunal previously laid down and which was being followed in the present case, were the Tribunal to accept the *Burlington* award as being a final disposition of the counterclaim, it would essentially be re-opening its Interim Decision on Counterclaim and grafting on to it reasons and findings made by another tribunal which are inconsistent with this Tribunal's own prior findings.[605]

496. Thus, from the perspective of a de-centralised international legal regime in which investment treaties confer jurisdiction over *ad hoc* tribunals which in turn have jurisdiction only over the parties to the disputes brought before them, and where it is accepted that different tribunals considering similar matters can arrive at different conclusions, in the Tribunal's view, by the time of Perenco's Second Dismissal Application it was far too late to turn off the process which the Tribunal had ordered to be conducted and which was nearing its completion.

497. Third, the only party which has sought to treat the *Burlington* Decision on Counterclaim as having *res judicata* and preclusive effect on the continued prosecution of the present counterclaim is Perenco. Likewise, the only party that characterises the *Burlington* Settlement Agreement as bringing the environmental and infrastructure counterclaims to an end is Perenco, a non-party to that agreement. The 2011 agreement on the counterclaim between Burlington and Ecuador, the *Burlington* Decision, and the Burlington-Ecuador Settlement Agreement do not purport to hold that the Consortium's liability was definitively and finally determined by that tribunal's decision.

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605 Interim Decision on Counterclaim, paragraph 581: "The Tribunal has set out the main issues of fact and law which have divided the experts. However, with regard to many of the IEMS/GSI differences, the Tribunal does not feel able to prefer one above the other. It seems to the Tribunal that each was attempting to achieve the best result for the party by whom they were instructed, and that they crossed the boundary between professional objective analysis and party representation. It is clear to the Tribunal that the experts were effectively shooting at different targets and this has made the work of this Tribunal most difficult." [Emphasis added.]

(b) Ecuadorian law on the effect of the Settlement Agreement and Annex 3 on Perenco's liability

498. The Ecuadorian law issue concerns the effect of the Ecuador-Burlington Settlement Agreement and its Annex 3 on Perenco's liability to Ecuador under Ecuadorian law.

499. The stated purpose of Annex 3 to the Settlement Agreement was to amongst other things ensure that Ecuador does not receive double recovery for the same damage/harm through the counterclaims against Perenco in the *Perenco* arbitration. The Settlement Agreement also explicitly contemplated certain relationships between the Burlington settlement and the ongoing *Perenco* arbitration and the implications of the former for the latter.

500. In the Tribunal's view, the Settlement Agreement shows that the parties thereto did not intend for that agreement to affect the prosecution of the *Perenco* environmental counterclaim, except to the extent that Burlington secured Ecuador's agreement not to pursue it for additional damages and not to seek double recovery for those damages which were paid pursuant to the Agreement.

501. The "fairness" argument advanced by Perenco, namely, that Burlington would not have truly achieved a "full and final settlement and release" from the counterclaims because it continues to bear exposure to damages on the counterclaims if this Tribunal were to order a larger quantum of damages, is undermined by the fact that no attempt was made by Burlington or Ecuador to vary Burlington's JOAs with Perenco. Without Perenco's consent, it was not open to the other two parties to attempt to change the terms of the JOAs, specifically the contribution provision. Perenco therefore stands in the same position now as it was in before the Burlington-Ecuador settlement, namely, Perenco has the contractual right to call upon Burlington to assume its aliquot share of any damages ultimately awarded by this Tribunal.

502. While Perenco relies on its joint and several liability with Burlington to argue that the Settlement Agreement discharges its own liability, it appears that under Article 2363 of the Ecuadorian Civil Code, Perenco cannot enforce the Settlement Agreement against Ecuador. That article reads:

> "A settlement is binding between its signatories only. Where there are several who may have an interest in the settlement, the settlement made by one of them cannot be enforced by or against the others, except where there is a novation and the underlying obligation is joint and several."[606]

503. Ecuador explains that, by virtue of this provision, the civil law notion of mutual representation does not apply. This means that a debtor (*i.e.* Perenco) would be not able to rely on a settlement entered into by the creditor with another co-debtor (*i.e.* Burlington). The Settlement Agreement is binding between Ecuador and Burlington only.

504. Perenco seeks to read Article 2363 of the Ecuadorian Civil Code restrictively. It appears to argue that the provision only addresses situations where joint debtors to settle *their own share* of a joint and several liability and provides that such a settlement would be binding between its signatories only.[607] It therefore argues that the provision is inapplicable here because Ecuador did not settle Burlington's aliquot share of the environmental harm with Ecuador. Rather, Burlington paid Ecuador full reparation for the environmental harm Ecuador claimed against the Consortium. In this regard, Perenco relies on (in addition to its own pleadings in relation to its First Dismissal Application and the Second Dismissal Application) the recitals in the Settlement Agreement and the *Burlington* Decision on Counterclaims.[608]

505. Perenco's argument can be addressed on two levels: first, whether Burlington and Ecuador settled the whole of the Consortium's joint and several liability in such a way as to bind Ecuador towards Perenco under Article 2363 of the Civil Code; and second, whether as a matter of Ecuadorian law, Article 2363 of the Civil Code operates in the way that Perenco contends. With respect to the first issue, the Tribunal considers that it is addressed by the language in the Settlement Agreement which discusses the limits of that agreement, its relationship to the *dispositif* of the *Burlington* Decision on Counterclaims, and that award's relationship in turn to the ongoing *Perenco* arbitration.

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606 EL-390.

607 Reply, paragraph 32.

608 *Burlington* Decision on Counterclaims, paragraph 1099.

506. While it is indeed the case that Ecuador was making "*a full claim for the alleged environmental harm in each of the Burlington and Perenco cases*", the *Burlington* tribunal clearly contemplated that the present Tribunal could come to a different conclusion on the quantum of damages and left it to this Tribunal to fashion its decision to prevent double recovery by Ecuador. The Settlement Agreement itself recognises this state of affairs.

507. In the Tribunal's view, the parties to the Settlement Agreement intended that the *Burlington* decision was determinative of the liability owed by Burlington to Ecuador, but *not* determinative of the entirety of the environmental harm caused to Ecuador more generally.

508. This appears to accord with the notion of tortious liability in the Ecuadorian civil law system. In this regard, the Tribunal accepts Ecuador's submission that the notion of tortious liability in the civil law system is significantly different from that in the common-law system. Unlike the common law, which looks for the existence of a relationship between the tortfeasor and the victim (such as to establish the existence of a duty of care, breach of which leads to liability), the civil law system is more concerned with whether damage has been caused by a person's act(s). If damage occurs, tortious liability follows (without any inquiry as to whether the parties were in a particular relationship such that tortious liability could arise). Thus, Ecuador's explanation, which emphasises the civil law's preoccupation with the occurrence of damage, supports the Tribunal's continued determination of the full extent of the contamination (subject, of course, to the restrictions laid down for the work of the Independent Expert). Ecuador has argued that the *Burlington* tribunal almost certainly did not accurately estimate the extent of the contamination. (As shall be seen, the expert opinion of Mr. MacDonald supports this view.) Given that situation, a failure to properly estimate the damage would mean that the victim of the tortious conduct would be under-compensated.

509. The Tribunal considers further that the *Burlington* tribunal, comprising three distinguished civil law-trained arbitrators, could be taken to be familiar with the civil law system's approach towards tortious liability. The members of that tribunal did not evince any concern in proceeding independently to decide the *Burlington* counterclaim even though their decision was rendered after this Tribunal's Interim Decision on Counterclaim, and

despite the fact that the Consortium operator (Perenco) was not before them. Moreover, instead of declaring that they were determining the whole of the Consortium's liability, the *Burlington* tribunal explicitly left it to the present tribunal to address any risk of double recovery:

> "69. The Tribunal is mindful of the separate nature of the two arbitrations and of its duty to resolve the dispute before it solely on its own record and merits. This said, the Tribunal is also mindful of the risk of double recovery, to which it will revert, and of the potential risk of contradictory decisions. For reasons linked to the value of coherence of the legal system, it considers that contradictory decisions on identical issues should be avoided to the degree possible without sacrificing any party's rights of due process or fairness. While ruling on the basis of the record in this case exclusively, the Tribunal will refer to the *Perenco* Decision in those instances where, in spite of the desire to avoid contradictions, it reaches a conclusion different from that of the *Perenco* tribunal.
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> 70. As regards the risk of double recovery (item (iv) above), Ecuador does not dispute that it seeks what Burlington calls "identical overlapping compensation with regard to the same alleged damage" in both proceedings. It also agrees that there is a risk of double recovery. This being so, at the end of the Hearing, Ecuador explained that it does not intend to recover its claimed damages twice, but that it will rely on whichever decision proves to be more favorable to its position. Burlington, on its part, requested that the Tribunal expressly address the risk of double recovery, such that "if the dispositive part of either of the awards on counterclaims provides for any compensation, Ecuador would be prevented from enforcing the second award to the extent that it has already been compensated by the first". The Tribunal addresses double recovery below (Section D)."[609] [Emphasis added.]

510. Therefore, based on the above, the Tribunal finds that the Settlement Agreement could only have been intended to settle what the *Burlington* tribunal thought was the damage suffered by Ecuador (subject to intra-Consortium claims under the JOAs which apply as between the two Consortium partners and, crucially, subject to what this Tribunal would decide).

511. Turning to the second issue, it is difficult to read Article 2363 in the manner which Perenco contends when the provision does not state that it applies only to partial settlements. In any event, the fact of the settlement by one party that is jointly and severally liable with one or

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609 *Ibid.*, paragraphs 69-70.

more others does not in and of itself permit a non-settling party to plead the settlement. By its own terms, Article 2363 requires not only a relationship of joint and several liability, but also a novation of the settlement agreement. Thus, on a plain reading of that provision, Perenco can claim the benefit of Settlement Agreement *only if* there has been a novation *and* the underlying liability is joint and several.[610] There is no allegation that the Ecuador-Burlington Settlement Agreement has been novated to the benefit of Perenco. Indeed, the terms of the Settlement Agreement are explicitly to the contrary in that the rights and benefits of the settlement are expressly limited to the parties thereto.

512. Finally, the *Burlington* tribunal expressly recognised "its duty to resolve the dispute before it solely on its own record and merits" while the *Perenco* proceeding continued.[611] This point, with which the Tribunal agrees, has particular salience because of the fundamentally different approaches taken by the two tribunals on the environmental counterclaim. The *Burlington* tribunal decided to conduct a site visit and to rely upon the expert evidence of IEMS and GSI, picking and choosing between their respective findings on individual items. This Tribunal believes that its Independent Expert is in a better position to provide a more technically-sound and more rigorous evaluation of the conditions in the sites than what can be obtained through a site visit. Nor was it willing to rely upon the reports produced by the Parties' experts without their data and findings being evaluated and confirmed (or not) by an independent expert.

513. Accordingly, the Tribunal has dismissed Perenco's Second Dismissal Application[612] and it now turns to the work of the Independent Expert.

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610 Response, paragraph 100.

611 *Burlington* Decision on Counterclaims, paragraph 69.

612 Mr. Kaplan cannot agree with the majority on this conclusion. He considers that on its true interpretation the Settlement Agreement between Burlington and Ecuador releases the other co-contractor, namely Perenco.

D. The Independent Expert's Work

1. Mr. MacDonald's Qualifications

514. The Tribunal noted above at paragraph 47 that after the Parties were unable to negotiate a settlement of the environmental counterclaim, they jointly agreed on the appointment of Mr. Scott MacDonald as the Tribunal's Independent Expert. Mr. MacDonald's qualifications are set out in his Independent Expert's Report and they are not repeated here. Suffice to say that he has some 30 years of experience in advising corporate clients, conducting risk-based multimedia investigations and remediation under various federal, state and local regulatory programmes on a global basis; performing different types of environmental assessments, and providing expert witness testimony in litigations and arbitrations on, among other things, the performance or non-performance of environmental obligations, defences against claims for primary restoration and compensatory damages for groundwater in natural resource damages litigation; private-party cost-recovery actions as related to the source, distribution, and fate of soil sediment and groundwater contamination; underground storage tanks; cost recovery actions under US legislation, and insurance coverage disputes. Much of his work has involved the oil sector.[613] Finally, although he had not previously worked in Ecuador, Mr. MacDonald has experience working throughout much of Latin America.

2. Scope of the Independent Expert Report

515. On 19 December 2018, Mr. MacDonald issued his Independent Expert Report. He confirmed that he was and remained independent of the Parties and also confirmed that the scope of his work was bound by the Tribunal's Interim Decision on Counterclaim.[614]

516. The following partial summary of the Independent Expert Report is included to set out the Independent Expert's description of his work, his findings, and prescriptions for remediation so as to provide the requisite context for the Tribunal's discussion of the Parties' comments and criticisms of the Independent Expert Report and the Tribunal's

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613 Independent Expert Report, p. 2.

614 *Id.*

findings thereon. The following summary of the Independent Expert Report is merely that; no inference should be drawn from the Tribunal's attempt to extract and reproduce here what it considers to be the most salient points made by the Independent Expert. The Report stands as a whole and is the authoritative statement of the Independent Expert's views, as supplemented by his presentation and testimony given during the course of the Expert Hearing.

517. Mr. MacDonald began by describing his mandate as to resolve certain key issues bearing on the extent, if any, of compensable environmental contamination in Blocks 7 and 21 as determined in accordance with the Tribunal's findings set out in its Interim Decision on Counterclaim and the Tribunal's clarifications of his mandate.

518. In order to do so, he first reviewed what the Parties' experts had done, identified what he considered to be significant data gaps that required resolution, and to the extent that he found contamination in the sampling conducted at sites that had previously been identified by one or both of the Parties' experts as being contaminated, estimated the remediation cost based on the Tribunal's finding that in-country cost estimates should be employed.[615] His Independent Expert Report describes the documentary material provided to him by the Tribunal and the Parties.[616] This was supplemented by visits to representative sites during November 2016 and again during field work performed in the fall of 2017.[617] Finally, under his direction, Ramboll generated independent data and analyses to close significant data gaps in the investigation of soils, and generated a technically valid data set to replace prior groundwater data gathered by the Parties. Ramboll also conducted work needed to document the compliance status of mud pits previously used by Perenco with applicable Ecuadorian regulations.[618] Mr. MacDonald described how his samples were taken, how

615 Section 1.3 of the Independent Expert Report, p. 2.

616 Listed at Section 8.0 of the Independent Expert Report.

617 Section 1.5 of the Independent Expert Report, p. 4.

618 Section 1.3 of the Independent Expert Report, p. 2.

they were handled, and where they were shipped in order to be analysed by a qualified laboratory.[619]

519. Mr. MacDonald stated that his intent was to supplement the existing work performed by the Parties' experts in conservative compliance with Ecuador's laws and regulations so as to establish a more reliable technical platform to support the Tribunal's decision in this matter.[620] As instructed by the Tribunal, his technical work was limited to:[621]

(a) Investigation at sites at which: (i) soil contamination was identified by one or both Parties above applicable Ecuador regulatory remediation criteria; (ii) groundwater was previously investigated by the Parties; and (iii) mud pits determined to have been used by Perenco were present;

(b) For soils, investigation was limited to areas previously assessed by one or both Parties, where existing data were insufficient to develop a technically valid remediation cost estimate;

(c) For groundwater, investigation was limited to sites where groundwater sampling had previously been conducted by the Parties, but where more technically sound investigation methodologies were needed. Mr. MacDonald's work was intended to confirm the presence or absence of groundwater contamination at these sites utilising more advanced and accepted well installation and sampling methods. The delineation of groundwater contamination was not requested by the Tribunal and was outside the scope of this effort; and

(d) For mud pits, investigation was limited to mud pits that were determined to have been used during Perenco's operations.

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619 Appendices D and E to the Independent Expert Report.

620 Independent Expert Report, p. 5.

621 *Ibid.*, p. 4.

520. Mr. MacDonald considered that his work was sufficient to significantly narrow the range of potential environmental cleanup costs at the site. While some uncertainties remained, he stated that he had sought to reduce the degree of these uncertainties.[622] He considered that his engineering cost estimates are both locally implementable and technically viable.

521. The Independent Expert Report was transmitted to the Parties for their review and comment. The paragraphs that follow are intended to provide a summary of the points made in the Independent Expert Report.

3. Assessment of Baseline Information

522. Mr. MacDonald confirmed the Tribunal's view that despite the work conducted by the Parties' experts, considerable uncertainty regarding site conditions remained, and in his opinion, this was largely attributable to the differing philosophical purposes of the experts' work as well as their technical approaches to obtaining and processing data. His Independent Expert Report identified the most significant issues as follows.

523. The Parties' experts took different approaches to their analyses. In his view, IEMS attempted to mirror what he called an "ASTM-type due diligence process", through which potential areas of environmental concern could be identified by means of reviewing documentation provided by the Parties or other sources of information; interviews with representatives of the Parties, site personnel with knowledge of historical site activities (currently with Petroamazonas) and local community members; and site inspections. Follow-up sampling was conducted in selected areas to assess whether contamination was present in areas previously identified as RECs.[623] Where it did identify contamination

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622 *Id.*

623 ASTM (E 1527-05, as cited by IEMS) defines a REC as "*The presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include de minimis conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be de minimis are not recognized environmental conditions.*"

(defined by IEMS as being above its base values), modeling of the data gathered via the IDW method was then conducted to derive an estimate the extent of contamination.[624]

524. GSI's work, on the other hand, was intended to test the validity of IEMS' findings. GSI conducted its own site inspections to confirm and/or identify new areas of potential impact, conducted further characterisation activities with respect to ground water, and used soil contamination delineation techniques, as well as human health risk assessment tools, to evaluate IEMS' findings. GSI's efforts were, in Mr. MacDonald's view, more like a remedial investigation, in which delineation of limited and previously identified areas of contamination was conducted.

525. Mr. MacDonald concluded that in the case of both experts, the "technical choices made by the Parties, intended or not, embedded biases within their findings":[625] IEMS significantly overestimated actual contamination at the sites while GSI underestimated it.[626] This accorded with the Tribunal's own view expressed in the Interim Decision on Counterclaim.

526. This resulted in incomplete site characterisation as well as radically different conclusions. Mr. MacDonald discussed how this affected the experts': (i) site investigation practices (discussed in the Report at Section 2.5.2); (ii) data evaluation techniques (discussed in the Report at Section 2.5.4); and (iii) cost estimation approaches (discussed in the Report at Section 2.5.5).

527. In order to evaluate these methods and the results that they generated, Mr. MacDonald reviewed the Tribunal's Interim Decision on Counterclaim and distilled the key findings which bore on the applicable Ecuadorian environmental standards to be applied. His summary of the relevant findings is contained in his Independent Expert Report at Section 3.

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624 Independent Expert Report, pp. 32-33.

625 *Ibid.*, p. 11.

626 *Ibid.*, pp. 11 & 12.

528. He also took note of the Tribunal's findings on the changes effected to the Ecuadorian legal regime insofar as the Constitution's changes to the fault-based liability regime was concerned.[627]

4. The Land Use Issue

529. Mr. MacDonald noted that the Tribunal rejected Ecuador's assertion that natural background conditions were required to be met as a remediation objective at the sites and therefore provided direction on which numerical criteria should be applied. In the case of soils, such criteria depend on the land use of the area being evaluated. The basis for determining land use and the criteria used to classify land use are described below.

(a) Land Use Designations

530. Neither RAOHE nor TULAS provided clear guidance as how best to identify the applicable land use criteria for any particular site. GSI evaluated 20 remediation projects at oil fields in the Oriente operated by Petroecuador, Petroproducción, and other operators, which showed that in 80-90% of cases reviewed, the agricultural land use criteria were generally applied.[628]

531. GSI considered that IEMS had applied the 'sensitive ecosystem' criteria too broadly. RAOHE defines the sensitive ecosystem criteria as "*maximum permitted concentrations aimed for the protection of sensitive ecosystems such as National Heritage Natural Protected Areas and other identified in the corresponding site-specific Environmental Assessment*." These are further described as follows:

(i) **National Heritage Natural Protected Areas** – Under Articles 66 and 67 of the Forest and Natural Areas and Wildlife Conservation Law or "LFCANVS" *(Ley Forestal y de Conservación de Areas Naturales y Vida Silvestre)* certain areas are expressly designated and mapped for protection due to their flora and fauna or their

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627 *Ibid.*, point 5 of Section 1.6.1.

628 *Ibid.*, fn. 112.

constituting ecosystems that contribute to the maintenance of ecological equilibrium.[629] Boundaries for these protected areas include or are in the immediate vicinity of the Payamino 1/CPF, Payamino 2/8, Payamino 4 and 14/20/24, Payamino 18, Payamino 19, Payamino 23, Waponi-Ocatoe, and Nemoca platforms.[630]

(ii) **Environmental Assessment –** Under RAOHE, Article 33, indicates that Environmental Impact Assessments (EIS) may include *inter alia* an Environmental Diagnosis – Base Line *(Estudio de Impacto Ambiental inclusive el Diagnóstico Ambiental - Línea Base)*, which is defined under the Environmental Management Law *(Ley de Gestión Ambiental* as a technical administrative procedure which seeks to determine beforehand the environmental viability of a project, construction activity, or private or public activity.

532. Pursuant to RAOHE Article 3.1, the Environmental Diagnosis – Base Line, where available, would be an appropriate resource to identify site-specific sensitive areas. Article 41, section 3.2.2, of the RAOHE requires the identification of land ecosystems, vegetative cover, flora and fauna, aquatic or marine ecosystems, sensitive areas, unique flora and fauna specimens, endangered or in danger species, and potential threats to the ecosystem. No further guidance is provided regarding sensitive ecosystems.[631]

(b) Selected Criteria for Classifying Land Use

533. Mr. MacDonald found that for most of the subject sites, baseline assessments were either unavailable or did not provide sufficient information to determine whether the site was located in a sensitive ecosystem.[632] He took note of the Tribunal's finding that, given the importance of the rainforest ecosystem, one should err on the side of the most protective

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629 *Ibid.*, fn. 113: http://www.ambiente.gob.ec/areas-protegidas-3/.

630 *Ibid.*, fn. 114: IDEC paragraph 494 and GSI ER I Appendices L.23, L.26, and L.29.

631 Independent Expert Report, p. 37.

632 *Id.*

criteria.[633] For purposes of evaluating sampling results, he therefore applied the following guidelines:

(a) The land uses identified within the Interim Decision on Counterclaim and documents provided by the Parties were reviewed. In most cases, Ramboll's observations were generally consistent with those of the Parties. Ramboll relied on its own observations rather than documentation presented by others; however, Mr. MacDonald stated, in no case was a conflict between Ramboll's observations and the determination of an Ecuadorian authority identified.

(b) Industrial criteria applied within the boundaries of existing platforms or CPFs that contain processing equipment, operating wells, or dormant wells that could be returned to service. Operating areas containing other in-use infrastructure (such as waste transfer stations, soil treatment areas, power oil pumping stations) were also considered to be industrial. The areas of these platforms are generally defined by fencing and/or perimeter collection trenches.

(c) Soils that are not situated on platforms were considered to be potentially accessible to the public, livestock, and wildlife. Such areas were therefore subject to more stringent, non-industrial criteria (*i.e.*, sensitive ecosystem/ residential or agricultural). For mud pits located outside of the platform limits, the upper 30 centimeters of material were assumed to be bio-available and considered to have the same land uses as neighboring soils. Commercial criteria were generally not applicable to the sites and are not considered in his work.

(d) Agricultural criteria would apply within cleared areas, open pastures, or areas that were under active cultivation. The agricultural criteria would also apply to areas clearly used for animal grazing.

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633 IDEC, paragraph 495.

(e) Residential and sensitive ecosystem criteria would apply to all other lands, including:

(i) Designated parks and preservation lands;

(ii) Residential properties;

(iii) Primary forests, secondary forests, and open pastures that do not appear to be heavily used by livestock;

(iv) Formerly cultivated lands that are fallow, or lands that contain both native and infilled crops, and/or native plants that are harvested; and

(v) Former platforms that have been abandoned or are designated for closure.[634]

534. The very broad applicability of the sensitive ecosystem criteria was intended to best facilitate restoration of lands that might have been affected by oil extraction activities, but are protected under Ecuador's 2008 Constitution. This application also was also considered to be responsive to the local residents' dependency upon the natural environment for food.

535. Where individual parameters were found naturally at concentrations exceeding the most stringent applicable criteria (either agricultural or sensitive ecosystem/residential), then in accordance with Ecuador's regulations, the "background criteria" would apply (see the further discussion in Section 3.1.2.1 and Appendix C to the Tribunal's Independent Expert Report).[635]

5. Remediation Standards

536. The remediation standards applicable to soil, mud pits and groundwater are defined in TULAS and RAOHE. In the case of soils, published remediation criteria are defined based on the specific land use of the area investigated and consider the development of background criteria where baseline conditions indicate the natural presence of regulated

634 Independent Expert Report, p. 38.

635 *Id*.

constituents above the published criteria. The numerical criteria for all media are described at Section 3.2 of the Independent Expert Report.[636]

6. Selection of Analytical Parameters

537. Based on the findings from the prior work, as well as the analytical suite of parameters chosen by Ecuador's own consulting team,[637] the compounds assessed by Mr. MacDonald in the Blocks are set out in Table 3.4 of his Independent Expert Report:[638]

Table 3.4: Selected Contaminants of Concern

Analyte	Soils	Mud	Groundwater	Notes
TPH	X	X	X	TPH represented by the sum of GRO, DRO and MRO (see Section 3.1.6).
PAHs	-	X	-	PAHs were initially evaluated by the Parties in soils and groundwater but were not found at levels of concern and were omitted from later work.
Barium	X	X	X	Ba was evaluated by the Parties in all media.
Cadmium	X	X	X	Cd was evaluated by the Parties in all media.
Chromium	X	X	X	Cr had been initially evaluated by the Parties in soil but did not carry forward in subsequent phases of investigation because "no relevant concentrations of such component were detected." However, Cr was retained because it is a compound required for leachability testing in the mud pits, was included in the original suite of groundwater constituents analyzed by the Parties, and had been found above applicable numerical remediation standards in multiple soil samples.
Copper	-	-	X	Cu was not tested by the Parties in soils and is not required in RAOHE for mud pit materials but was analyzed by the Parties in groundwater.
Lead	X	-	X	Pb is not required in RAOHE for mud pit materials.
Nickel	X	-	X	Ni is not required in RAOHE for mud pit materials.
Vanadium	X	X	-	V was not assessed in groundwater because there is no corresponding groundwater or drinking water standard, nor did the Parties test for this metal in their groundwater work.
Conductivity	-	X	X	Soil conductivity and pH were not retained for soils because these are indicator parameters only.
pH	-	X	-	

636 See Independent Expert Report, Table 3.1 for soils, Table 3.2 for mud pits, and Table 3.3 for groundwater.

637 Independent Expert Report, p. 44 & fn. 123, referring to IEMS, 2011, p. 31.

638 *Ibid.*, pp. 44-45.

(a) Indicator Parameters

538. Earlier in the proceeding, Perenco's expert, GSI, contended that the only reliable parameters that could be used to assess the impact of oilfield operations are TPH (crude oil), barium (drilling mud), and soil electrical conductivity (produced water). "*The presence of other chemicals in the soil, in the absence of a primary indicator (e.g. nickel in the absence of elevated barium or TPH) cannot be caused by an oil field material and was therefore not retained for further investigation.*"[639] GSI's contaminant delineation methodology reflected this opinion; heavy metals that were not also found in the presence of an indicator compound were not identified as contaminants requiring further delineation and/or remedy and were not investigated.

539. In Mr. MacDonald's view, TPH, barium, and conductivity are useful indicators that, where elevated, suggest a potential impact on the environment resulting from petroleum operations. However, heavy metals may also be associated with well drilling operations, crude oil extraction and/or with formation water management. While Perenco asserted that its formation waters were reinjected, the potential exists for this material to have been discharged during its storage, conveyance and management. Therefore, the presence of heavy metals in soils at levels above background due to petroleum operations could not be entirely discounted. That said, where metals were found in absence of barium or TPH, special attention was considered to be merited to assess whether the detections are more likely to be attributable to oilfield activities or to natural background conditions.[640]

(b) Conductivity and pH

540. Mr. MacDonald concurred with IEMS and GSI that there was limited utility in using conductivity or pH as parameters to determine the presence or extent of contaminated soils. Electrical conductivity and pH were included in the assessment of mud pit materials (as required by RAOHE).[641]

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639 Independent Expert Report, p. 45 & fn. 124, referring to the Interim Decision on Counterclaim, paragraph 242.

640 *Ibid.*, pp. 45-46.

641 *Ibid.*, p. 46.

7. Analyses

(a) Laboratory and Method Selection

541. Mr. MacDonald explained that selecting a laboratory for this project was challenging due to the limited availability of an adequate local facility that could complete all necessary tests, and which was also satisfactory to both Parties. In the end, ALS Environmental, based in Houston, Texas, was chosen based on its certifications, its having an office in Ecuador that could support sample handling and management, and its ability to manage the transport of the samples from the sites to its laboratory in Houston.

542. Mr. MacDonald sought to ensure that method selection adhered as closely as possible to those methods specified by Ecuador in RAOHE Annex 5 and TULAS. However, he noted, in some cases, the laboratory methods stipulated in the regulations were outdated. He therefore chose alternatives which, in his professional judgement were appropriate. Details on the sample management procedures and the methods for analysis used in his work are provided in Appendices D and E of his Report.

(b) Total Petroleum Hydrocarbons

543. Mr. MacDonald also gave consideration to the TPH methods selected for use at this site since the methods specified in RAOHE Annex 5 have largely been withdrawn and are no longer in professional use.[642] Two potentially suitable methods were used by the Parties in their investigations: IEMS used the Texas Natural Resources Conservation Commission (TNRCC) Method 1005, while GSI used SW846 8015C for soil and groundwater samples and TNRCC Method 1006 for soil samples. In consultation with the laboratory, Mr. MacDonald chose to use SW846 8015C for analysis of GRO (C6-C10), DRO (C10-C28), and ORO (C20-C35), so that the possible sources of the petroleum could be better

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642 *Ibid.*, p. 46 & fn. 126: The following methods and publications were referenced in RAOHE Annex 5, but were not selected for various reasons: (a) 6/1997 ECY 97-602 is not a method, but is a publication summarizing multiple TPH methods; (b) EPA 413.1 s used for measurement of oil and grease, not TPH; (c) EPA 418.1, which was applicable to TPH, was withdrawn by the USEPA in 2007 due to its use of Freon 113 as a solvent; (d) method 1664 (SGT-HIEM) is used for measurement of oil and grease, not TPH; (e) ASTM D3921-96 was withdrawn by ASTM in 2013, and not replaced due to its limited use by industry; and (f) German standard DIN 38409-H18 is inactive.

evaluated.[643] To compare the results appropriately to the standards, he elected to add these fractions together to obtain a total TPH value. This technique has the potential for increasing the reported concentration of TPH in a sample due to overlapping carbons between the fractions. However, in Mr. MacDonald's professional opinion, this was a reasonable and conservative approach.

(c) Metals

544. All soil, groundwater and mud pit leachate samples were analysed for metals using USEPA Method SW6020A. Consistent with prior analyses conducted by the Parties' experts, only the following metals were analyzed: barium, cadmium, chromium, copper, lead, nickel, vanadium, and zinc.

545. RAOHE specifies a number of specific atomic absorption methods for the analysis of metals. In Mr. MacDonald's view, IEMS used such methods for metals analyses consistent with RAOHE. As for TPH, Ecuador allows for substitution of equivalent methods for metals analysis in place of those listed in Annex 5. As such, GSI used method 6010B, an inductively coupled plasma-atomic emission spectrometry method, for all metals. Ramboll's selected method 6020A, also performed via inductively coupled plasma mass spectrometry, was similar to that selected by GSI. All of the methods used by the Parties' experts and by Ramboll would be considered acceptable and equivalent pursuant to RAOHE.

546. TULAS does not identify specific methods, but rather indicates that they should be consistent with those specified within the Institute of Ecuadorian Normalization or by ASTM or the USEPA.

(d) Leachability Testing

547. Mr. MacDonald subjected mud pit samples to both TCLP and SPLP analyses ((EPA SW-846 1311 and 1312, respectively). The leachate generated would then be analysed for the

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643 Independent Expert Report, p. 46 & fn. 127: Carbon ranges may vary slightly; those listed in the text were obtained from a fact sheet "Petroleum Hydrocarbon Ranges" presented by ALS, the laboratory used for this work.

parameters required in RAOHE Table 7: TPH, barium, cadmium, total chromium, and vanadium using the analytical methods described above; and PAHs, using USEPA Method 8270D.

(e) Geotechnical Testing

548. As part of the monitoring well installation, Mr. MacDonald's team collected soil samples from the screened interval in the water bearing zones for sieve and hydrometer analysis to define the percentage of clay in accordance with ASTM Methods and D6913 and D7928, respectively. (No geotechnical testing methods are specified in RAOHE or TULAS.)

8. Bounding of Scope and Site Screening

(a) Key Scope Considerations

549. Mr. MacDonald noted that he was mandated by the Tribunal to conduct additional soil, groundwater and mud pit sampling in the Blocks as needed to determine the presence and/or extent of contamination for which remediation is required. The scope of these activities was further bound as follows:[644]

(i) Mr. MacDonald was directed only to consider areas at the sites that were previously investigated by the Parties. His investigation was not to include sampling either at new RECs that he may have independently identified, or at RECs previously identified by the Parties that had not been sampled.

(ii) Only one sampling programme was authorised by the Tribunal. As such, a multi-phased sampling approach as might be more typical to delineate contamination was not implemented. Therefore, Mr. MacDonald decided that by use of a "macro" sampling approach, the data that could be obtained from one field campaign would still serve to narrow the extent of potential contamination at the sites.

644 Independent Expert Report, p. 49.

(iii) Mr. MacDonald also sought to identify usable data generated by prior work conducted by the Parties to avoid unnecessary duplication.

(iv) He also determined it was not necessary to delineate every point where contamination was observed above a standard in soils. In some cases, the available data and other factors (*e.g.*, topography) were sufficient in his view to reasonably estimate remedial quantities even if not fully delineated in all directions. In other instances, the available data suggested that the "exceedance" was likely not related to oil field contamination but rather to probable background conditions.

(v) Mr. MacDonald also determined that it was appropriate to analyse for the full metal suite in every sample where any metal was previously detected above applicable criteria, rather than to restrict the analysis to specific metal exceedances in each area investigated. He did not test samples for TPH if no TPH was suspected, based on prior data, nor did he test for metals if prior data suggested only the presence of hydrocarbons.

(b) Site Screening

550. Ramboll reviewed all data collected by the Parties for the purpose of developing a sampling programme in Blocks 7 and 21. Mr. MacDonald stated that the key consideration in this exercise was to determine appropriate screening criteria with respect to: (i) sites selected for additional sampling; (ii) data screens for various media or features, including soils, groundwater, and mud pits; and (iii) the basis and background for the additional site investigation approach.[645] Along with Ramboll's exercise of professional experience and judgement, this was considered appropriate to address what he called "*significant gaps in the overall technical analyses*" performed by the Parties' experts.

645 *Id.*

551. A total of 69 sites were subjected to a "*desktop screening*" evaluation.[646] Screening included consideration of:

(a) The numerical criteria defined in RAOHE or, in its absence, TULAS, for unrestricted, agricultural, and industrial land uses;

(b) Reassessment of land use designations by the Parties;

(c) Location and quantity of temporary monitoring wells previously installed by the Parties;

(d) The historical use of mud pits by Perenco; and

(e) The nature of claims made on behalf of Ecuador.

552. Initial screening resulted in a proposed suite of work that flagged 38 sites for supplemental investigation, including 30 sites where soils were to be investigated, 14 sites where groundwater was to be investigated, and 9 sites where mud pits were to be investigated. Mr. MacDonald then eliminated the following from his initial workplan:[647]

(a) 21 sites were eliminated from consideration because no damages claims were made in respect of them;[648]

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646 Independent Expert Report, fn. 129: Mr. MacDonald used the total of 70 sites presented in IEMS' cost estimate; however, Coca 2 and Coca CPF were considered as one site.

647 *Ibid.*, pp. 49-50.

648 *Ibid.*, fn. 130: "While numerous sites were included in IEMS' initial financial claim (above the "base value"), some sites were ultimately excluded from their claim based on application of the regulatory criteria. All such sites were initially screened out from further investigations by Ramboll. During implementation of the investigation, Ecuador identified to Ramboll that some soil samples collected from sites where no regulatory claim was made may have exceeded regulatory criteria (see Appendix B). As a result, Ramboll re-examined these sites and where appropriate, expanded our program to include sites or areas of sites that had originally been omitted from the sampling program (e.g. Oso A)."

(b) Eight additional sites were excluded because there were: (i) no groundwater claims; (ii) no evidence of mud pit use by Perenco; and (iii) no soil samples contained contamination above applicable soil cleanup criteria (excluding conductivity); and

(c) Eight additional sites were excluded because: (i) contaminant delineation was near-complete; or (ii) only marginal exceedances of a single contaminant was detected.

553. As a result of further consultation with the Parties, the initial screening evaluation was expanded to incorporate additional facts and findings. The final results of the screening evaluation are presented in the subsections below.

(i) Sites Excluded from Further Consideration

554. Certain sites identified by GSI and IEMS did not require any supplemental investigation based on the results of the Parties' previous work. The following sites did not require further testing for any media:[649]

Table 4.1 – Sites Omitted from Ramboll's Investigation

Block	Site	IEMS Claim ($ millions)[1]	Rationale[2]
CPUF	Coca 7	0	No soil exceedances, Perenco mud pits, or prior groundwater sampling
CPUF	Coca 11	1.8	No soil exceedances, Perenco mud pits, or prior groundwater sampling
CPUF	Coca 12	1.0	No soil exceedances, Perenco mud pits, or prior groundwater sampling
CPUF	Coca 13	8.2	No soil exceedances, Perenco mud pits, or prior groundwater sampling
CPUF	Coca 15	11.0	No soil exceedances, Perenco mud pits, or prior groundwater sampling
7	Gacela 3	0	IEMS claim limited to oil well closure ($0.5 million); no soil exceedances, Perenco mud pits, or previous groundwater sampling
7	Gacela 6,9	0	No soil exceedances, Perenco mud pits, or prior groundwater sampling

649 *Ibid.*, Table 4.1.

Table 4.1 – Sites Omitted from Ramboll's Investigation			
Block	Site	IEMS Claim ($ millions)[1]	Rationale[2]
7	Lobo 2	0	No soil exceedances, Perenco mud pits, or prior groundwater sampling
7	Mono 10/12	1.0	Soil exceedances limited to trace barium concentration adjacent to a mud pit not associated with Perenco; no previous groundwater sampling
7	Oso 2	0	No soil exceedances, Perenco mud pits, or prior groundwater sampling
CPUF	Payamino 5	4.9	Soil exceedances limited to trace vanadium concentration (background condition); no Perenco mud pits or prior groundwater sampling
CPUF	Payamino 6	0	No soil exceedances, Perenco mud pits, or prior groundwater sampling
CPUF	Payamino 9	0	No soil exceedances, Perenco mud pits, or prior groundwater sampling
CPUF	Payamino 18	0	No soil exceedances, Perenco mud pits, or prior groundwater sampling
CPUF	Payamino 19	0	No soil exceedances, Perenco mud pits, or prior groundwater sampling
21	Waponi – Dayuno	12.9	Site was abandoned prior to Perenco's operations in the Blocks. IEMS cost estimate includes soil and groundwater remediation
21	Waponi – Ocatoe	2.3	No soil exceedances or Perenco mud pits. Previous groundwater sampling found only zinc above TULAS criteria. As zinc is a non-oil field parameter, and there were no other affected media, this exceedance was not considered for further evaluation.
21	Yuralpa - Puerto Napo	0	No soil exceedances, Perenco mud pits, or prior groundwater sampling
21	Yuralpa Pad B	0	No soil exceedances, Perenco mud pits, or prior groundwater sampling
21	Yuralpa – Sumino 1	0.5	No soil exceedances, Perenco mud pits, or prior groundwater sampling
CPUF	Coca 7	0	No soil exceedances, Perenco mud pits, or prior groundwater sampling.

Notes

[1] Value of IEMS claim based on regulatory criteria obtained from 2013 IEMS cost estimates presented in Attachment 35. This information is presented to provide the Tribunal with a sense of scale as to the potential importance of the site to the overall matter; these claims did not drive Mr. MacDonald's determination of whether to include or exclude a site from further consideration. The claims exclude costs for oil well closure.

[2] "No soil exceedances" means that upon reassessment of land use at the sites, no soil samples were found above the applicable numerical remediation criteria.

555. The initial desktop-based screening process reduced the total number of sites from 69 to 49 (an ~30% reduction in sites requiring review). The next step was to identify the environmental media to be sampled at each of the 49 sites. The tables below provide Mr. MacDonald's rationale for the exclusion of soil, groundwater, and/or mud pit investigations at specific sites based on his review of the available data.

(ii) Soils Excluded from Further Consideration

556. The table below summarises those sites where Mr. MacDonald considered that further evaluation was appropriate for mud pits and/or groundwater, but no additional testing of soils was merited. Rationales for the exclusion of the soil medium are provided for each site.[650]

Table 4.2 – Sites Where Soils Not Further Investigated

Block	Site	IEMS Soil Claim		Adjusted Soil Claim ($ millions)	Rationale[3]
		$ millions[1]	% Associated with Mud Pit[2]		
7	Jaguar 9	38.3	0%	38.3	No exceedances of soil regulatory criteria when correct land use applied (e.g. industrial criteria on platform and excluding samples collected from inside mud pits).
7	Lobo 3,5,6,7	3.6	100%	0	No exceedances of soil regulatory criteria. IEMS claim was restricted to area of mud pit.
7	Oso 3-7, 13-14	0	0%	0	No exceedances of soil regulatory criteria. Site only considered due to Perenco mud pit.
7	Oso 9,12,15-20	22.3	100%	0	No exceedances of soil regulatory criteria. IEMS claim was restricted to area of mud pit.
CPUF	Payamino 13	0	0%	0	No exceedances of soil regulatory criteria. Site only

650 *Ibid.*, Table 4.2.

Table 4.2 – Sites Where Soils Not Further Investigated					
Block	Site	IEMS Soil Claim		Adjusted Soil Claim ($ millions)	Rationale[3]
		$ millions[1]	% Associated with Mud Pit[2]		
					considered due to previous groundwater testing.
21	Yuralpa LF	7.8	100%	0	No exceedances of soil regulatory criteria (all prior samples above soil criteria collected from mud pits, although IEMS attributed 0% to the pits in its memorandum).
21	Yuralpa Pad E	2.6	100%	0	No exceedances of soil regulatory criteria. IEMS claim was restricted to area of mud pit.
21	Yuralpa Pad G	2.7	100%	0	No exceedances of soil regulatory criteria. IEMS claim was restricted to area of mud pit.

Notes

[1] IEMS claim obtained from regulatory-based soil remediation cost reported in IEMS 2013, Attachment 35.

[2] Percentage of mud pit as presented by IEMS in a 22 November 2017 email from Gabriela González Giráldez to Marco Tulio Montañés-Rumayor.

[3] Previous soil samples met all numerical regulatory criteria when the industrial criteria were applied on the platform and the sensitive ecosystem or agricultural criteria were applied off the platform, as appropriate.

557. In Mr. MacDonald's judgement, the sites listed above did not require further soils sampling because the available documentation showed no evidence of soils exceeding the most stringent applicable Ecuadorian regulatory criteria.[651] Most of the claims associated with the sites listed above were limited to mud pits, with "exceedances" reported by IEMS limited to soil samples collected from within mud pit boundaries.

(iii)Mud Pits Excluded from Further Consideration

558. Platforms containing mud pits to be assessed for physical integrity, conformance to the RAOHE performance criteria, and cover material integrity and quality were selected based on: (i) whether mud pits were present at a given site; and (ii) whether or not there was evidence of prior use by Perenco, as based on the timing of mud pit closure (where known)

651 *Ibid.*, p. 53.

and oil production well installation (where pit closure dates were not available); and (iii) other information provided by the Parties, including discussions with the Parties' representatives in the field. Mr. MacDonald's assessment of those mud pits that were associated with Perenco was provided to the Parties for confirmation.

559. Mr. MacDonald also reviewed documentation presented by IEMS regarding the reworking of wells, which IEMS had alleged may have resulted in residuals that required disposal. There was no record of on-site disposal of these residuals for any of the reworking activities as described in the attached reports; therefore, Mr. MacDonald did not suspect any mud pits of being "re-opened" for such activities. He also reviewed available leachability testing data presented by GSI to determine if prior sampling and data evaluation, having regard to RAOHE Tables 7a/7b, had been adequately conducted. While he considered that the previous testing had some utility, in all cases, additional testing was needed to assess the conditions of the pits.

560. The sites where mud pit testing was not proposed are listed below:[652]

Table 4.3 – Sites Where Mud Pits Not Further Investigated

Block	Site	IEMS Mud Pit Claim $ millions[1]	Oil Well Installation	Mud Pit Closure Date	Rationale
CPUF	Coca 1	0	1/1971	n/a	No mud pits at site
CPUF	Coca 2, CPF	1.3	12/1988	3/2001	Perenco use not identified
CPUF	Coca 4	0	1/1990	6/1997	Perenco use not identified
CPUF	Coca 6	0	10/1989	unknown	Perenco use not identified
CPUF	Coca 8	2.3	8/1991	unknown	Perenco use not identified
CPUF	Coca 9	0	1/1993	n/a	No mud pits at site
CPUF	Coca 10, 16	0	9/1993	unknown	Perenco use not identified
7	Gacela CPF, 1 and 8	0.7	2/1991	unknown	Perenco use not identified
7	Gacela 2	0	6/1992	2/1998	Perenco use not identified
7	Gacela 4	1.3	3/1994	unknown	Perenco use not identified
7	Gacela 5	2	9/1994	unknown	Perenco use not identified

652 *Ibid.*, Table 4.3.

Table 4.3 – Sites Where Mud Pits Not Further Investigated

Block	Site	IEMS Mud Pit Claim $ millions[1]	Oil Well Installation	Mud Pit Closure Date	Rationale
7	Jaguar 1	0	1/1988	unknown	Perenco use not identified
7	Jaguar 2	8.9	12/1988	unknown	Perenco use not identified
7	Jaguar 3	0	1/1994	1/1994	Perenco use not identified
7	Jaguar CPF, 5 Camp	0	1/1996	7/1996	Perenco use not identified
7	Jaguar 7,8	0	2/1996 6/1996	10/1996	Perenco use not identified
7	Lobo 1	0	2/1989	unknown	Perenco use not identified
7	Mono CPF, 1-5, IW	0	Various 1989-1997	9/1996	Perenco use not identified
7	Mono Sur, 6-9, 11	0	Various 1996-1997	unknown	Perenco use not identified
7	Oso 1, CPF	0	9/1970	unknown	Perenco use not identified
CPUF	Payamino CPF, 1	0	11/1986 (1) 1992 (CPF)	3/2001	Perenco use not identified Pits at the site were used for produced water from CPF, not drilling mud.
CPUF	Payamino 2 & 8	0	5/1987 9/1992	Unknown 8/1993	Perenco use not identified
CPUF	Payamino 3	2.2	8/1987	unknown	Perenco use not identified
CPUF	Payamino 4	10.9	7/1988	unknown	Perenco use not identified
CPUF	Payamino 14, 20, 24		5/1994 6/1994 5/2001	9/1994 Unknown 12/2001	Perenco use not identified
CPUF	Payamino 10	1.7	3/1993	6/1993	Perenco use not identified
CPUF	Payamino 13	0	10/1993	unknown	Perenco use not identified
CPUF	Payamino 15	2.0	12/1993	unknown	Perenco use not identified
CPUF	Payamino 21	0	10/1994	n/a	No mud pits at site (mud disposed at Payamino 16 IW)
CPUF	Payamino 23	0.8	5/1997	8/2000	Perenco use not identified

Table 4.3 – Sites Where Mud Pits Not Further Investigated

Block	Site	IEMS Mud Pit Claim $ millions[1]	Oil Well Installation	Mud Pit Closure Date	Rationale
CPUF	Punino 1	1.2	12/1990	unknown	Perenco use not identified
21	Waponi - Nemoca 1	0	12/1999	2/2000	Perenco use not identified
21	Yuralpa Pad D	0	8/2006	n/a	Two existing pits are lined and unused. The pits reportedly contained mud/cuttings that had been removed and transferred to the Yuralpa LF.

Notes

[1] Perenco's site operations were conducted from 9/2002 – 7/2009.

(iv) Groundwater Excluded from Further Consideration

561. As instructed by the Tribunal, Mr. MacDonald limited his groundwater sampling activities to those sites where prior testing had been performed by the Parties.[653] Additionally, he excluded three sites where testing had been conducted, but in his judgement further testing was not merited (two of these sites were completely omitted from his programme). His reasons for this were as follows:

(i) The Waponi-Ocatoe site was excluded from further investigation because prior testing by IEMS had identified only the presence of zinc above the applicable TULAS standard (zinc at 1.38 mg/L). Zinc is not an oil field contaminant, and no other media at this site indicated the potential presence of oil field contaminants.

(ii) The Waponi-Dayuno site was entirely excluded because, although groundwater was sampled previously by IEMS, Perenco never operated on this platform.

653 *Ibid.*, fn. 131: Mr. MacDonald notes that in correspondence dated 14 November 2017, Perenco raised some concerns regarding the groundwater approach, including issues related to both the locations of monitoring wells and the use of filtration. These matters were addressed in his correspondence dated 28 December 2017 (found at Appendix B to his report).

(iii) The Yuralpa Landfill site was tested by IEMS only. GSI had attempted to install a test well at this facility, but experienced refusal prior to encountering groundwater. Mr. MacDonald excluded this site because it was the only groundwater location in Block 21, based on GSI's experience there was a low probability of success, and the work would have necessitated the mobilisation of different drilling equipment, which was not readily available, to the Block.[654]

562. All other sites where groundwater was sampled by the Parties remained in the supplemental programme.

(c) Outcome of Screening Evaluation

563. The desktop screening process resulted in a reduction of the number of sites warranting investigation of soils, mud pits, and/or groundwater from 69 to 49 sites. The sites and media that were omitted from further review were associated with IEMS' remediation cost estimates totaling $119.5 million, or 13.6% of the total regulatory-based claim of $876 million.

564. Table 4.4 of Mr. MacDonald's report lists the sites and environmental media that were further investigated, as well as the approximate amount of the IEMS regulatory-based claims associated with those facilities.

Table 4.4 – Sites and Media Included in Ramboll's Supplemental Investigation[2]

Platform	Media in Supplemental Investigation			IEMS Remediation Cost Estimate ($Millions)					% of Total Claim
	Soil	Mud Pit	GW	Soil	Mud	GW[1]	Oil Wells	Total	
Coca 1	■			29.7	0.0	0.0	0.0	29.7	*3.39*
Coca 2, CPF	■		■	82.1	1.3	4.6	0.0	88.1	*10.05*
Coca 4	■			3.6	0.0	0.0	0.0	3.6	*0.41*
Coca 6	■			10.0	0.0	0.0	0.0	10.0	*1.14*
Coca 7				0.0	0.0	0.0	0.0	0.0	*0.00*
Coca 8	■			35.9	2.3	0.0	0.0	38.2	*4.37*
Coca 9	■			23.0	0.0	0.0	0.0	23.0	*2.63*

654 *Ibid.*, p. 56.

Table 4.4 – Sites and Media Included in Ramboll's Supplemental Investigation[2]									
Platform	Media in Supplemental Investigation			IEMS Remediation Cost Estimate ($Millions)					% of Total Claim
	Soil	Mud Pit	GW	Soil	Mud	GW[1]	Oil Wells	Total	
Coca 10, 16	■			0.3	0.0	0.0	0.0	0.3	*0.03*
Coca 11				1.8	0.0	0.0	0.0	1.8	*0.21*
Coca 12				0.1	0.9	0.0	0.0	1.0	*0.12*
Coca 13				8.2	0.0	0.0	0.0	8.2	*0.93*
Coca 15				11.0	0.0	0.0	0.0	11.0	*1.25*
Coca 18, 19	■	■		29.4	4.0	0.0	0.0	33.4	*3.82*
Cóndor N 1	■	■		25.3	2.8	0.0	0.5	28.7	*3.27*
Gacela 1, 8, CPF	■		■	23.2	0.7	4.6	0.0	28.5	*3.25*
Gacela 2	■		■	17.4	0.0	2.3	0.5	20.2	*2.31*
Gacela 3				0.0	0.0	0.0	0.5	0.5	*0.06*
Gacela 4	■			0.0	1.3	0.0	0.0	1.3	*0.15*
Gacela 5	■			0.0	2.0	0.0	0.0	2.0	*0.23*
Gacela 6, 9				0.0	0.0	0.0	0.0	0.0	*0.00*
Jaguar 1	■		■	1.0	0.0	2.3	0.0	3.3	*0.38*
Jaguar 2	■		■	5.3	8.9	2.3	0.5	17.0	*1.94*
Jaguar 3	■			12.0	0.0	0.0	0.0	12.0	*1.37*
Jaguar 5, Camp, CPF	■			0.3	0.0	0.0	0.0	0.3	*0.04*
Jaguar 7, 8	■			38.6	0.0	0.0	0.5	39.1	*4.47*
Jaguar 9		■		38.3	0.0	0.0	0.5	38.8	*4.43*
Lobo 1	■			1.5	0.0	0.0	0.0	1.5	*0.17*
Lobo 2				0.0	0.0	0.0	0.0	0.0	*0.00*
Lobo 3, 5, 6, 7		■		0.0	3.6	0.0	0.0	3.6	*0.41*
Lobo 4	■			0.0	0.0	0.0	0.5	0.5	*0.06*
Mono 1-5, CPF, IW	■		■	103.7	0.0	2.3	0.0	106	*12.11*
Mono Sur, 6-9, 11	■			11.5	0.0	0.0	0.0	11.5	*1.31*
Mono 10, 12				0.0	1.0	0.0	0.0	1.0	*0.11*
Oso 1, CPF	■			22.6	0.0	0.0	0.0	22.6	*2.58*
Oso 2				0.0	0.0	0.0	0.0	0.0	*0.00*
Oso 3-7, 13-14		■		0.0	0.0	0.0	0.0	0.0	*0.00*
Oso 9, 12, 15-20		■	■	0.0	22.3	2.3	0.0	24.6	*2.80*
Oso A, 21, 22, 23	■			0.0	0.0	0.0	0.0	0.0	*0.00*
Payamino 1, CPF	■		■	40.1	0.0	2.3	0.0	42.43	*4.83*
Payamino 2, 8	■		■	31.9	0.0	2.3	0.0	34.2	*3.90*

Table 4.4 – Sites and Media Included in Ramboll's Supplemental Investigation[2]									
Platform	Media in Supplemental Investigation			IEMS Remediation Cost Estimate ($Millions)					% of Total Claim
	Soil	Mud Pit	GW	Soil	Mud	GW[1]	Oil Wells	Total	
Payamino 3	■			0.0	2.2	0.0	0.0	2.2	*0.25*
Payamino 4	■		■	34.3	0.0	2.3	0.0	36.6	*4.18*
Payamino 5				4.0	0.9	0.0	0.0	4.9	*0.56*
Payamino 6				0.0	0.0	0.0	0.0	0.0	*0.00*
Payamino 9				0.0	0.0	0.0	0.0	0.0	*0.00*
Payamino 10	■			0.0	1.7	0.0	0.0	1.7	*0.19*
Payamino 13			■	0.0	0.0	2.3	0.0	2.3	*0.26*
Payamino 14, 20, 24	■		■	21.2	10.9	2.3	0.0	34.4	*3.93*
Payamino 15	■		■	0.0	2.0	2.3	0.0	4.3	*0.49*
Payamino 16	■			10.5	2.6	0.0	0.0	13.1	*1.50*
Payamino 18				0.0	0.0	0.0	0.0	0.0	*0.00*
Payamino 19				0.0	0.0	0.0	0.0	0.0	*0.00*
Payamino 21	■			2.0	0.0	0.0	0.0	2.0	*0.22*
Payamino 23	■			0.0	0.8	0.0	0.0	0.8	*0.09*
Payamino LF	■	■		0.0	26.5	0.0	0.0	26.5	*3.02*
Punino 1	■			1.4	1.2	0.0	0.0	2.6	*0.30*
Waponi Dayuno				10.6	0.0	2.3	0.0	12.9	*1.47*
Waponi Nemoca 1	■			15.1	0.0	0.0	0.0	15.1	*1.72*
Waponi Ocatoe				0.0	0.0	2.3	0.0	2.3	*0.26*
Yuralpa Chonta	■	■		0.0	1.1	0.0	0.0	1.1	*0.13*
Yuralpa Pad A	■	■		1.7	0.0	0.0	0.0	1.7	*0.19*
Yuralpa Pad B				0.0	0.0	0.0	0.0	0.0	*0.00*
Yuralpa Pad D	■			7.9	0.0	0.0	0.0	7.9	*0.91*
Yuralpa Pad E		■		0.0	2.6	0.0	0.0	2.6	*0.30*
Yuralpa Pad F / CPF	■			0.0	0.0	0.0	0.0	0.0	*0.00*
Yuralpa Pad G		■		0.0	2.7	0.0	0.0	2.7	*0.31*
Yuralpa LF		■		0.0	7.8	2.3	0.0	10.1	*1.16*
Yuralpa Puerto Napo				0.0	0.0	0.0	0.0	0.0	*0.00*
Yuralpa Sumino 1				0.5	0.0	0.0	0.0	0.5	*0.06*
Included in Ramboll Investigation	41	12	13	$642.4	$76.1	$34.4	$3.5	$756.4	*86.4%*
Excluded	**28**	**57**	**56**	**$74.5**	**$38.1**	**$6.9**	**$0.0**	**$119.5**	*13.6%*
Total	**69**	**69**	**69**	**$716.9**	**$114.2**	**$41.3**	**$3.5**	**$875.9**	*100%*

Table 4.4 – Sites and Media Included in Ramboll's Supplemental Investigation[2]

Platform	Media in Supplemental Investigation			IEMS Remediation Cost Estimate ($Millions)					% of Total Claim
	Soil	Mud Pit	GW	Soil	Mud	GW[1]	Oil Wells	Total	

Notes:

[1] The IEMS cost estimates for groundwater remediation provided in Table 35 of its 2013 Expert Report are the low-end groundwater cost estimates ($2.3 million per site, with those for Coca 2/CPF and Gacela 1/8/CPF doubled to reflect multi-platform site designations). The high-end IEMS estimates for groundwater, with contingencies included, were $13.5 million per site. These higher values were referenced in IEMS' reports, but were not included in Table 35, so were not incorporated here.

[2] Blue-shaded cells represent IEMS cost estimates that have been excluded from further review (refer to Sections 4.2.2 and 4.2.3. of Mr. MacDonald's report). Dark-shaded rows represent sites that have been excluded from further review (refer to Section 4.2.1 of report).

9. Sampling Results

565. Mr. MacDonald's site-specific sampling plans were prepared for each site and medium that was retained for consideration after completing the screening. The guiding principles for these plans are described in summary under Section 5.1 of his Report and in greater detail in Appendices D and E.

566. Between 19 September to 15 December 2017, teams were mobilised to Blocks 7 and 21 to implement the site-specific sampling plans under Mr. MacDonald's direction. The summary of his findings is set out below.

(a) Mud Pits

Table 5.1: Summary of Mud Pit Investigation Findings

Site	Mud Pit #	Exceedances of Leachability Criteria for Lined Pits					Exceedances of Applicable Soil Criteria for Cover Material (Totals Analysis)				
		Ba	TPH	PAH	pH	Cond	Ba	Cd	Ni	TPH	Criteria
Chonta [1]	1								X		Ind
	5	X		Y	X		X		X		Eco
Coca 18, 19 [2]	2	X	X	Y							Ind
	3	X		Y							Ind
	4	X			X						Ind
	5	X		X							Ind
	6				X						Eco
Cóndor Norte	1				X						Eco
	2	X					X				Eco
	3						X				Eco
Jaguar 9	1				X		X	X	X		Eco
Lobo 3	1										Ind
	2				X						Ind
Oso 3	1	X					X				Ind
Oso 9 [3]	1	X		X							Ag
	3	X	X	Y							Ag
	5	X	X	Y	X						Ag
	6			X	X						Ag
	7			Y	X	X	X				Ag
	8										Ag
	9			X		X					Ag
Oso 9A	Area 1				X						Eco
	Area 2				X		X				Eco
	Area 3				X		X				Eco
	Area 4	X					X				Eco
Oso 9B	Area 1	X			X		X				Eco
	Area 2		X		X					X	Eco
	Area 3				X		X				Eco
Payamino LF	1	X			X		X				Ind
Yuralpa A	1	X	Y	Y	X	X	X				Eco
	2										Ind
	3				X						Ind
Yuralpa E	1				X		X				Ind

Table 5.1: Summary of Mud Pit Investigation Findings

Site	Mud Pit #	Exceedances of Leachability Criteria for Lined Pits					Exceedances of Applicable Soil Criteria for Cover Material (Totals Analysis)				
		Ba	TPH	PAH	pH	Cond	Ba	Cd	Ni	TPH	Criteria
Yuralpa G	1						X				Ind
	2	X		Y	X		X				Ind
	3				X						Ind
Yuralpa LF	1	X			X		X				Eco
	2	X		X			X		X		Eco
	3	X		Z	X		X				Eco
Subtotals for TCLP Parameters (Exceedance of One Parameter within One Mud Pit)											
% (of 39 Mud Pits)		18	5	13	23	3	19	1	4	1	
		46%	13%	33%	59%	8%	49%	3%	10%	3%	
% (of 12 Sites)		9	3	6	11	2	10	1	3	1	
		75%	25%	50%	92%	17%	83%	8%	25%	8%	
Subtotals for Sites (Exceedance of at least One TCLP Parameter within at least One Mud Pit)											
% (of 39 Mud Pits)		33					21				
		85%					54%				
% (of 12 Sites)		12					10				
		100%					83%				

Notes:

[1] X = exceeds using TCLP Extraction only; Y = exceeds using TCLP and SPLP; Z = exceeds using SPLP Extraction only

[2] All of the above data was generated from testing conducted by Ramboll, except the following:

- At Lobo 3, Mud Pit 1, GSI also conducted testing. Their results were consistent with Ramboll's
- At Oso 9, Mud Pits 1, 3, and 6 were tested by GSI only
- At Yuralpa Pad A, Mud Pit 1, GSI also conducted testing. They identified only pH and conductivity in the mud pit material in excess of the leachability criteria, and barium in excess of the soil remediation criteria as applied to cover material.

[3] The above table presents only the results of TCLP testing. Results of the SPLP testing are separately addressed in Section 6.

[4] Mud Pits 2, 3, and 4 at Chonta are not associated with Perenco operations.

[5] Mud Pit 1 at Coca 18/19 is not associated with Perenco operations.

[6] At Lobo 3, two additional samples (LOB03-MP04 and LOB03-MP05) were collected along the southeast fence line due to conflicting records on the alignment of the mud pits at the site. Ramboll's field observation and sampling results suggest that these samples were not collected from mud pits and confirm the alignment of the mud pits.

[7] Mud Pits 2 and 4 at Oso 9 are associated with Perenco but were not investigated by Ramboll or the Parties. These two mud pits are likely to contain contamination similar to that found in neighboring Mud Pit 1 and Mud Pits 3 and 5, respectively.

[8] Cadmium, chromium, and vanadium were tested but not detected above the most stringent leachability criteria in any of the mud pit material samples.

[9] Chromium, lead, and vanadium were not detected above the most stringent applicable soil remediation criteria in any of the soil cover samples.

567. In general, the following can be concluded from the mud pit investigation:

(a) Mr. MacDonald concluded that no information was provided that was sufficient to confirm that synthetic or clay liners are present beneath any specific mud pit. Ramboll did not drill through the bottom of the mud pits to determine the presence or absence of liner material, since this would have compromised the units if the liners were present. In some cases, Ramboll did observe torn liner material along some mud pit perimeters but had no information regarding its condition or lateral extent in the rest of the mud pit. Therefore, Mr. MacDonald decided that, without exception, the leachability testing data should be conservatively compared to the standards for unlined mud pits presented in RAOHE Table 7a.

(b) The current land use in the area of each mud pit was identified as part of Ramboll's site assessment activities. The cover material analytical data were compared to the industrial, agricultural, or sensitive ecosystem/residential criteria in TULAS Table 3, Annex 2, and RAOHE Table 6, as applicable.

(c) At least one mud pit did not meet the performance criteria at the 12 sites investigated. Thirty-three of the 38 mud pits investigated by the Independent Expert did not meet the performance criteria for unlined mud pits specified in RAOHE (87%) and 14 of the 38 mud pits did not meet the performance criteria for lined pits specified in RAOHE (37%). Contaminants that did not comply with the performance criteria included pH, barium, total PAHs, TPH and conductivity. These mud pits, as well as two additional mud pits located at Oso 9 that were not investigated but are inferred to contain contamination similar to that found in neighbouring mud pits that failed one or more criteria, are considered to require remediation.

(d) The materials overlying 21 of the 38 investigated mud pits did not meet the soil remediation criteria applicable to soils based on determination of the applicable land use in the area. Contaminants that exceeded the criteria included barium, nickel, cadmium and TPH. In almost all cases (19 of 21 total mud pits), barium was the contaminant of concern that did not meet the criteria. This, in Mr. MacDonald's

opinion, suggests a high probability that the mud pit cover material is inadequate or nonexistent and that the mud pit materials are at or near the ground surface.

(e) When reviewed in totality, 100% of the sites that were investigated had at least one mud pit that did not comply with the leachability standards published in RAOHE (12/12 sites). In addition, 83% of the sites had at least one mud pit with inadequate cover material (10/12).

568. Mr. MacDonald identified the following site-specific findings as of particular interest:

(a) In Cóndor Norte, a slope failure was observed immediately adjacent to the mapped limits of the mud pits. Based on field observations, it appears that the slope failure envelope may extend into the mud pit.

(b) In Coca 18/19, the data suggest that the extent of Mud Pit 6 is greater than the area previously mapped by the Parties.

(c) In Lobo 3, the locations of the mud pits were not initially clear. Ramboll inspected the area and collected vertical composite samples along both the southwest and southeast edges of the pad to confirm the mud pit locations. It was determined that the mud pits are located along the southwest edge of the pad.

(d) Oso 9A slopes from the northeast to the southwest and is bound by steep slopes to the north and east. In the northeastern portion of the site, there is evidence of slope failure. Torn black plastic, possibly related to a liner system, was observed in the southwest portion of the site.

(b) Groundwater

569. Between 13 November and 14 December 2017, Ramboll collected samples from 34 permanent monitoring wells installed at 12 sites. The samples were analysed for TPH and metals as described above. The findings are presented in Table 5.2 of Mr. MacDonald's Report.

Table 5.2: Summary of Groundwater Investigation Findings						
Site	**Well Location (Proximate to REC#)**	**Well ID**	**Lithology**	**Turbidity**	**Exceedances of Applicable GW Criteria**	
			% Clay	**NTU**	**Ba**	**TPH**
Coca 2, CPF	Adjacent to mud pit (02-335)	COC02-MW01	15.1	2.7	X	X
	Adjacent to formation water pit (CPF-352)	COC02-MW02	14.3	0.0		X
	OW/API Separator discharge; swamp (CPF-354/357)	COC02-MW03	18.9	0.0		X
		COC02-MW04	3.2	0.0		X
		COC02-MW05	7.8	0.0		X
Gacela 1, CPF	West of platform (no REC)	GAC01-MW01	26.2	1.5	X	X
	Spill to creek SW of platform (02-371/1Y8-195/201)	GAC01-MW02	18.2	3.6	X	X
Gacela 2	West of platform and mud pit (no REC)	GAC02-MW01	32.6	13.5		X
	SW of platform and mud pit (02-369/02-422)	GAC02-MW02	65.8	13.3		X
Jaguar 1	NW of platform (no REC)	JAG01-MW01 [3]	8.9	1.2		
	West of platform (1-311)	JAG01-MW02	13.9	0.3		X
Jaguar 2	Adjacent to mud pit (2-314/315)	JAG02-MW01	-	13.8		X
	West of mud pit (2-314/315)	JAG02-MW02 [4]	57.3	1.2		
	NW of platform (2-298)	JAG02-MW03	30.8	7.8		X
Mono 1, CPF	North of platform (112)	MON01-MW01	34.1	0.0	X	X
	NE of platform (111)	MON01-MW02	14.9	0.0		
	East of platform in mud discharge area (105/CPF-400)	MON01-MW03	38.8	0.0	X	X
	South of platform (CPF-486)	MON01-MW04	18.2	4.2	X	X
Oso 9	West of mud pits (9-331/340)	OSO09-MW01	4.9	7.6		
	Adjacent to mud pits 1-9 (9-331/340)	OSO09-MW02	13.9	0.9		X
Payamino 1, CPF	West of fire water pond	PAY01-MW01	13.0	12.6		X
	Catchment area	PAY01-MW02	28.0	7.1		X
	NW of CPF (CPF-166)	PAY01-MW03	16.4	5.4		
Payamino 2 / 8	Swamp NE of mud pit (143 / 2Y8-351/435)	PAY02-MW01	22.7	13.2	X	X
	Swamp NE of mud pit (143 / 2Y8-351/435)	PAY02-MW02	49.3	0.0	X	
	Swamp east of platform (143 / 2Y8-351/435)	PAY02-MW04	50.3	0.0		X
Payamino 4 / Payamino 14/20/24	River access road, NE (04-114)	PAY04-MW01	-	3.1	X	X
	River access road at site corner (04-114)	PAY04-MW02	6.6	0.0	X	X
	Oil-contaminated area NW of Pay-14/20/24 and SW of mud pit	PAY04-MW03	16.5	0.0	X	X

Table 5.2: Summary of Groundwater Investigation Findings

Site	Well Location (Proximate to REC#)	Well ID	Lithology	Turbidity	Exceedances of Applicable GW Criteria	
			% Clay	NTU	Ba	TPH
	Adjacent to mud pit (no REC)	PAY14-MW01	7.6	13.7		
Payamino 13	SW of platform (No REC)	PAY13-MW01	15.5	0.0		X
	South of platform (No REC)	PAY13-MW02	23.0	12.1	X	X
Payamino 15	East of platform (No REC)	PAY15-MW01	30.4	9.8	X	X
	Adjacent to mud pit (111)	PAY15-MW02	32.8	0.0		
Total Wells with a TPH and/or Barium Exceedance						
% (of 34 wells – includes all)					13	25
					38%	74%
Totals Sites with at least One Well with a TPH and/or Barium Exceedance						
% (of 12 sites – includes all)					7	12
					58%	100%

Notes:
[1] To assist in well location orientation, Ramboll has provided REC# as identified by one or both Parties.
[2] At the time of sample collection, sheens and petroleum odors were observed in the samples collected from the following monitoring wells: COC02-MW01, COC02-MW02, COC02-MW03, and COC02-MW04, GAC01-MW02, JAG02-MW01, MON01-MW01, MW02, MW03, MW04, OSO09-MW02, PAY01-MW01, PAY02-MW01, PAY02-MW02, PAY02-MW04, PAY04-MW03, PAY13-MW01, PAY13-MW02 and PAY15-MW02.
[3] The TPH concentration in sample JAG01-MW01 was at the applicable criteria (325 ug/L).
[4] Sample JAG02-MW02 was analyzed for TPH using method TX1005 instead of method US EPA Method 8015. The detection method for this sample (450 ug/L) exceeded the applicable criteria of 325 ug/L.

570. In general, the following can be concluded:

(a) Mr. MacDonald considered that Ramboll's well construction and sampling techniques allowed it to produce non-turbid, unfiltered groundwater samples that accurately represent the chemical quality of groundwater at the sites. In all cases, sampled groundwater was observed to be clear and free of sediments and/or clouding and had a low turbidity (*i.e.*, less than 14 NTU, and in most cases below 10 NTU).

(b) Ramboll collected soil samples from the water bearing zones at each well to assess the clay content in the screened interval. This sampling was done, in part, to determine if there was some correlation between clay content and turbidity levels, and to address a reference in TULAS with respect to groundwater criteria. While the clay content varied between locations within and across sites, groundwater was produced in all wells and there seems to be little correlation between the clay content and the turbidity levels as determined from well sampling activities. The

relevance of these findings is discussed further in Section 6.1 of Mr. MacDonald's Report.

(c) Based on Ramboll's sampling results, TPH contamination in groundwater above the TULAS standard is present in all 12 investigated sites, and in 74% of sampled monitoring wells. The maximum observed concentration of TPH was 1915 µg/L at Payamino 2/8, as compared to the TULAS criterion of 325 µg/L. Barium is found at 58% of the sites, and in 38% of the sampled wells. The maximum observed concentration of barium was 4700 µg/L at Gacela 1, as compared to the criterion of 338 µg/L. No other contaminants of concern were identified in the monitoring wells.

(c) Soils

571. Between 19 September and 15 December 2017, Ramboll collected and analysed 801 soil samples from 40 sites. These samples were collected from locations intended to delineate areas of known soil contamination exceeding Ecuador's numerical criteria in TULAS (Table 3 of Annex 2) or RAOHE (Table 6) and to address significant data gaps. In general, Mr. MacDonald found that the aggregate exceedances of concentration criteria for soils do not directly correspond to the severity of contamination at a site or the need for site remediation. However, Mr. MacDonald made two key observations which apply to the totality of the soil data:

(a) The data collected by Ramboll fills data gaps and supplements data previously gathered by the Parties that indicated oilfield related contamination, primarily barium and TPH. It can, in his opinion, be relied upon to estimate remedial footprints.[655]

(b) Elevated cadmium and vanadium concentrations are found throughout the Blocks. As determined through background evaluations conducted by both the Parties and Ramboll, these concentrations largely appear to Mr. MacDonald to be associated

655 *Ibid.*, p. 78.

with natural background conditions.[656] Particularly for vanadium, the distribution of this metal appears to be both widespread and random, with a wide range of naturally occurring concentrations. There are a few cases where cadmium and vanadium were found at concentrations above the calculated background concentrations. In such instances, delineation sampling of these compounds was conducted.

(i) Block 7

572. For Block 7, Ramboll's findings were as follows.[657]

573. **Coca 1**: Soil exceedances in the low-lying swampy area southwest of the platform (REC 330; historical discharge) were delineated by samples at borings COC01-01 through COC01-06. Petroleum odor was noted in subsurface soils at COC01-02 and COC01-05. Neither TPH nor barium were detected above the agricultural criteria in any of the samples. However, vanadium (up to 180 mg/kg) exceeded the regulatory criterion to the southwest portion of this area. In combination with topographical features, the data provides an adequate framework for establishing a remedial footprint.[658]

574. **Coca 2 / CPF**: Within the areas investigated by Ramboll, the prior TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around four main areas:[659]

(a) TPH in the area southwest of the platform / CPF (REC 40; oil-water separator discharge) was delineated by samples at borings COC02-01 through COC02-03 as TPH did not exceed the applicable criterion in any of the samples.

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656 *Ibid.*, p. 78.

657 *Ibid.*, Section 5.3.3.1.

658 *Ibid.*, pp. 78-79.

659 *Ibid.*, p. 79.

(b) TPH in the area north of the former formation water pit (REC 352) was delineated by samples at borings COC02-04 and COC02-05 as TPH did not exceed the applicable criterion in any samples.

(c) TPH in the swampy area southeast of the platform / CPF (REC 354; historical discharge to swamp) was delineated by samples at borings COC02-06 through COC02-15 and COC02-18159 as TPH did not exceed the applicable criterion in any of the samples. It should be noted, though, that petroleum odor and staining were noted in subsurface soils at COC02-11 and COC02-14.

(d) TPH in the area west of the Coca 2 mud pit (REC 335), where slight petroleum odor was noted during well installation next to the mud pit, was investigated by samples at borings COC02-16 and COC02-17. TPH did not exceed the applicable criterion in any of the samples.

575. **Coca 4**: Within the areas investigated by Ramboll, the prior barium exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: Barium in soils in the swampy area east of the platform (REC 244; oil-water separator discharge) were delineated by samples at borings COC04-01 through COC04-04 as barium did not exceed the sensitive ecosystem / residential criterion in any of the samples.[660]

576. **Coca 6**: Within the areas investigated by Ramboll, the prior barium and TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around two main areas:[661]

(a) The area southeast of the platform (not associated with a specific REC), which is a relatively flat area topographically higher than the swamp area, was further investigated by samples at borings COC06-01 through COC06-04, primarily to address barium. Other than the vertical delineation sample, barium (up to 1,070 mg/kg) exceeded the sensitive ecosystem / residential criterion in all sampling

660 *Ibid.*, pp. 79-80.

661 *Ibid.*, p. 80.

locations in the area investigated. Vanadium (up to 153 mg/kg) also exceeded the regulatory criterion in the same area.

(b) A low-lying swampy area (formerly described by GSI as a swale) also southeast of the platform (REC 257; historical discharge from workover activities) was further investigated by samples at borings COC06-05 through COC06-13. Petroleum odor and staining were noted in subsurface soils at COC06-06 and COC06-10. However, TPH did not exceed the sensitive ecosystem / residential criterion in any of the samples. Barium (up to 951 mg/kg) exceeded the applicable criterion along the western side of the swamp and at locations along the ridge that borders the swamp to the east. Vanadium (up to 216 mg/kg) also exceeded the applicable criterion around the same areas.

577. **Coca 8**: Within the areas investigated by Ramboll, the prior barium exceedances were not fully delineated vertically or horizontally. After additional sampling around two main areas:[662]

(a) An area to the northwest of the platform (REC 19; oil-water separator discharge) was further investigated by samples at borings COC08-01 through COC08-04. Barium (1,190 mg/kg) exceeded the agricultural criterion only to the south of the investigated area. Vanadium (up to 208 mg/kg) also exceeded the agricultural criterion in the same area.

(b) An area to the southwest of the platform (REC 20; oil-water separator discharge) was further investigated by samples at borings COC08-05 through COC08-08. Barium (1,480 mg/kg) exceeded the agricultural criterion only to the north of the investigated area. Nickel (up to 60.4 mg/kg) and vanadium (up to 207 mg/kg) also exceeded the agricultural criteria in the investigated area.

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662 *Ibid.*, pp. 80-81.

(c) The swampy area to the south of mud pits 2 through 4 (REC 251) was further investigated by samples at borings COC08-09 through COC08-21. Petroleum odor and staining were encountered in subsurface soils at boring COC08-09. Barium (up to 11,000 mg/kg) exceeded the sensitive ecosystem / residential criterion in the deepest interval sampled and in to the east, south and west of the investigated area. Cadmium (up to 1.12 mg/kg), lead (up to 89.1 mg/kg), nickel (up to 64.9 mg/kg) and vanadium (up to 184 mg/kg) exceeded the applicable criteria in all directions around the swamp.

578. **Coca 9**: Within the areas investigated by Ramboll, the prior vanadium and nickel exceedances were not fully delineated vertically or horizontally. After additional sampling around two main areas:[663]

(a) The area northwest of the platform (REC 61; possible discharge from the injection well) was further investigated by samples at borings COC09-01 through COC09-05. Neither vanadium nor nickel exceeded the sensitive ecosystem / residential criteria in any of the samples. Barium (up to 1,880 mg/kg) exceeded the applicable criterion in areas to the north and northwest.

(b) The area southeast of the platform (REC 60; oil-water separator discharge) was further investigated by samples at borings COC09-06 through COC09-08. Nickel did not exceed the agricultural criterion in any of the samples. Vanadium (up to 172 mg/kg) exceeded the applicable criterion in areas to the east and southeast.

579. **Coca 10 / 16**: Within the areas investigated by Ramboll, the prior barium and TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: A swampy area north of the platform (REC 175; oil-water separator discharge) was further investigated by samples at COC10-01 through COC10-03. TPH did not exceed the sensitive ecosystem / residential criterion in any of the samples. Barium

663 *Ibid.*, p. 81.

(up to 993 mg/kg) exceeded the applicable criterion along the northern steep edge of this swampy area. Vanadium (up to 154 mg/kg) and nickel (up to 50.1 mg/kg) also exceeded the applicable criteria in the same area.[664]

580. **Coca 18 / 19**: Within the areas investigated by Ramboll, the prior barium exceedances were not fully delineated vertically or horizontally. After additional sampling around three main areas: [665]

(a) Prior impacts to soils near the Coca 18 well (REC 273) were delineated by samples COC18-01 through COC18-03. Barium was not detected above the applicable criterion in any of the samples. However, exceedances of the applicable industrial criterion for vanadium (143 to 175 mg/kg) were found east, south, and west of the Coca 18 well.

(b) The area southwest of Mud Pit 6 (REC 274) was further investigated by samples at borings COC18-04 through COC18-11. Petroleum odor was encountered at borings COC18-04 and COC18-06. Barium (up to 1580 mg/kg) exceeded the sensitive ecosystem / residential criterion in areas east, south, and west of Mud Pit 6. Vanadium (up to 224 mg/kg) also exceeded the applicable criterion at these same areas. In addition, at certain isolated locations, chromium (up to 88.1 mg/kg) and nickel (up to 52.4 mg/kg) were detected above the applicable criteria.

(c) Pile 1 (not an identified REC but the project record suggested an area of possible historic disposal of oilfield materials) was further investigated by borings COC18-12 through COC18-14. Barium (up to 6220 mg/kg) was detected at concentrations exceeding the applicable sensitive ecosystem / residential criterion. Vanadium (up to 180 mg/kg) and cadmium (up to 1.35 mg/kg) were also detected above the applicable criteria.

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664 *Ibid.*, pp. 81-82.

665 *Ibid.*, p. 82.

581. **Cóndor Norte**: Within the areas investigated by Ramboll, the prior barium exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: The landslide area south of the platform (not associated with a specific REC) was further investigated by samples at CON01-01 through CON01-05. Barium (up to 2,140 mg/kg) exceeded the sensitive ecosystem / residential criterion in the deepest interval sampled (borings CON01-01 and CON01-05), and in boring CON01-02. Cadmium (up to 4.97 mg/kg) also exceeded the applicable criterion in all sampling locations. The boundaries of the sloughed materials were defined using a GPS and serve to define the remedial footprint.[666]

582. **Gacela 1 / 8 / CPF**: Within the areas investigated by Ramboll, the prior barium and TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around two main areas:[667]

(a) The swampy area south of the platform (REC 371; historical discharge) was further investigated by samples at borings GAC01-01 through GAC01-11. Petroleum odor and / or staining were encountered in subsurface soils at GAC01-01, GAC01-02, GAC01-04, GAC01-10 and GAC01-11. However, TPH did not exceed the sensitive ecosystem / residential criterion in any of the samples. Barium did not exceed the applicable criterion in any of the samples.

(b) The area southwest of the platform (REC 63; historical discharge) was further investigated by samples at borings GAC01-12 through GAC01-17. Petroleum odor was encountered in subsurface soils at borings GAC01-16. However, neither TPH nor barium exceeded the agricultural criteria in any of the samples.

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666 *Ibid.*, p. 83.

667 *Ibid.*, p. 83.

583. **Gacela 2**: Within the areas investigated by Ramboll, the prior barium and TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around two main areas:[668]

(a) The area west and downslope of the platform (which is not associated with a specific REC) was further investigated by samples at borings GAC02-01 through GAC02-04. Barium (up to 1,610 mg/kg) exceeded the sensitive ecosystem / residential criterion in the northeast portion of this area.

(b) The area between the two mud pits on the platform (which is not associated with a specific REC) was further investigated by samples at borings GAC02-05 through GAC02-08. Petroleum odor and staining were encountered in subsurface soils at GAC02-06 and GAC02-07. However, TPH did not exceed the sensitive ecosystem / residential criterion in any of the samples. Barium (up to 4,790 mg/kg) exceeded the sensitive ecosystem / residential criterion in this area. The data suggests that it is possible that the two mud pits may be contiguous.

584. **Gacela 4**: Within the areas investigated by Ramboll, the prior barium exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: Barium in soils near the Gacela 4 well (REC 304; possible discharge from wellhead) were delineated by samples at borings GAC04-01 through GAC04-04, as barium did not exceed the industrial criterion in any of the samples. Vanadium (up to 135 mg/kg) exceeded the applicable criterion to the northeast and south of this area.[669]

585. **Gacela 5**: Within the areas investigated by Ramboll, the prior lead exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: Lead in soils near the Gacela 5 well (REC 307; possible discharge from wellhead) were delineated by samples at borings GAC05-01 through GAC05-03 as lead did not exceed the

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668 *Ibid.*, p. 84.

669 *Id.*

industrial criterion in any of the samples. Vanadium (up to 138 mg/kg) and chromium (up to 106 mg/kg) exceeded the regulatory criteria to the east portion of this area.[670]

586. **Jaguar 1**: Within the areas investigated by Ramboll, the prior barium, nickel and TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around three main areas:[671]

(a) The area northwest of the mud pit and around the two open pits (REC 312) was further investigated by samples at borings JAG01-01 through JAG01-03, JAG01-15 and JAG01-17. Nickel (up to 81.9 mg/kg) exceeded the sensitive ecosystem / residential criterion in all sampling locations. Barium (722 mg/kg at JAG01-03), chromium (up to 127 mg/kg at JAG01-01 through JAG01-03, and JAG01-17) and vanadium (up to 193 mg/kg at all boring locations) also exceeded the corresponding regulatory criteria.

(b) The area surrounding the valve station (not associated with a specific REC), where a vanadium exceedance was previously detected (GSI sample JA01-3T-01) and historical petroleum impacts were reported by GSI162, was investigated by samples at borings JAG01-08 through JAG01-11. While the samples collected were not analyzed for TPH, no evidence of crude were identified in any of these borings. The samples collected from this area indicated the presence of nickel (up to 40.8 mg/kg) and vanadium (up to 165 mg/kg) above the regulatory criteria.

(c) The stream bed area and associated swamp (REC 311) was delineated by samples at borings JAG01-04 through JAG01-07, JAG01-12 through JAG01-14 and JAG01-16. Petroleum odor was noted in subsurface soils at JAG01-06. However, neither TPH nor barium exceeded the sensitive ecosystem / residential criteria in any of the samples. At certain isolated locations, chromium (up to

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670 *Ibid.*, pp. 84-85.

671 *Ibid.*, p. 85.

88.5 mg/kg), nickel (up to 81.7 mg/kg) and vanadium (up to 183 mg/kg) exceeded the regulatory criteria.

587. **Jaguar 2**: Within the areas investigated by Ramboll, the prior barium, nickel and TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around two main areas:[672]

(a) The area west of the mud pit (REC 314) was further investigated by samples at borings JAG02-01 through JAG02-05 and JAG02-15 through JAG02-17. Borings JAG02-02 and JAG02-15 through JAG02-17 were advanced in the slope failure area to the northwest of the mud pits. Petroleum odor and / or staining were encountered in subsurface soils at JAG02-02, JAG02-04, JAG02-15 and JAG02-17. Consequently, TPH analysis was added for samples at this site. TPH (up to 1,190 mg/kg) at JAG02-15 and barium (up to 1,100 mg/kg) at JAG02-01, JAG02-15 and JAG02-16 exceeded the sensitive ecosystem / residential criteria in the northern portion of this area. Chromium (up to 114 mg/kg), nickel (up to 220 mg/kg) and vanadium (up to 247 mg/kg) also exceeded the regulatory criteria at all boring locations, whereas lead did not exceed the applicable criteria in any of the samples.

(b) The area northwest of the platform (REC 298; possible historical spill) was further investigated by samples at borings JAG02-06 through JAG02-14. What appeared to be weathered crude was noted at the surface in several locations within the investigation area. However, TPH was not detected above the sensitive ecosystem / residential criterion in any of the samples. Barium (up to 7,920 mg/kg) and nickel (up to 88.8 mg/kg) exceeded the applicable criteria at several locations to the west, north and northeast. Lead (279 mg/kg) and cadmium (1.76 mg/kg) exceeded the applicable criteria at JAG02-07. Vanadium

672 *Ibid.*, pp. 85-86.

(up 204 mg/kg) and chromium (up to 121 mg/kg) also exceeded the applicable criteria at all boring locations.

588. **Jaguar 3**: Within the areas investigated by Ramboll, the prior barium and vanadium exceedances were not fully delineated vertically or horizontally. After additional sampling around two main areas:[673]

(a) Prior impacts to soil near the Jaguar 3 well (REC 237; possible discharges from wellhead) were further investigated by samples at JAG03-01 through JAG03-03. Barium exceeded the sensitive ecosystem / residential criterion south and west of the Jaguar 3 well. Cadmium (up to 1.54 mg/kg), chromium (up to 168 mg/kg), lead (up to 139 mg/kg), nickel (up to 80.1 mg/kg) and vanadium (up to 213 mg/kg) also exceeded the regulatory criteria in one or more locations south and west of the Jaguar 3 well.

(b) The eastern platform area (not associated with a specific REC) was further investigated by samples at borings JAG03-04 through JAG03-08 to investigate elevated vanadium along the eastern side of the platform. Vanadium (up to 196 mg/kg) exceeded the sensitive ecosystem / residential criterion at all borings. Barium (up to 936 mg/kg) exceeded the regulatory criterion at locations to the east and south sides of this area. Chromium (up to 118 mg/kg) exceeded the applicable criterion at all boring locations, while nickel (45.8 mg/kg) exceeded the regulatory criterion only at JAG03-04, JAG03-06 and JAG03-07.

589. **Jaguar 5 / CPF**: Within the areas investigated by Ramboll, the prior lead and vanadium exceedances were not fully delineated vertically or horizontally. After additional sampling around three main areas:[674]

(a) The area southeast of the platform (not associated with a specific REC) was delineated by samples at borings JAG05-01 through JAG05-03. Lead did not

673 *Ibid.*, pp. 86-87.

674 *Ibid.*, p. 87.

exceed the sensitive ecosystem / residential criterion in any of the samples addressing the initial objective of investigating this area given its proximity to residential living quarters. Vanadium (up to 182 mg/kg) and chromium (up to 78.2 mg/kg) also exceeded the regulatory criteria at all boring locations.

(b) Soils near the fuel depot (not associated with a specific REC) were further investigated by samples at boring JAG05-04. Vanadium (up to 175 mg/kg) exceeded the industrial criterion at this location. Chromium (up to 67.3 mg/kg) also exceeded the regulatory criterion at this location.

590. **Jaguar 7 / 8**: Within the areas investigated by Ramboll, the prior barium exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: Barium in the stream area east of the platform (not associated with a specific REC, but possibly associated with oil-water separator discharge) was delineated by samples at JAG07-01 through JAG07-03, as it was not detected above the agricultural criterion in any of the samples. Cadmium (up to 1.39 mg/kg) and chromium (up to 65.8 mg/kg) at two different locations and nickel (up to 63.7 mg/kg) at two locations exceeded the regulatory criteria in this area.[675]

591. **Lobo 1**: Within the areas investigated by Ramboll, the prior barium exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: The area surrounding the mud pit (REC 211) was further investigated by samples at borings LOB01-03, LOB01-04 and LOB01-04A. Petroleum odor was noted in subsurface soils at LOB01-04, so TPH analysis was added at LOB01-04 and LOB01-04A. However, TPH did not exceed the agricultural criterion in any of the samples. Barium (up to 10,600 mg/kg) exceeded the applicable criteria to the south and west portions of this area. Cadmium (up to 2.62 mg/kg), chromium (up to 88.3 mg/kg), lead (up to 212 mg/kg) and nickel (up to 60 mg/kg) also exceeded the regulatory criteria at these same locations.[676]

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675 *Ibid.*, pp. 87-88.

676 *Ibid.*, p. 88.

592. **Lobo 4**: Within the areas investigated by Ramboll, the prior barium exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: The northeastern area of the platform (not associated with an identified REC) was further investigated by samples at borings LOB04-01 through LOB04-05. Petroleum odor and / or staining were noted in subsurface soils at LOB04-02, LOB04-03, LOB04-04 and LOB04-05. Barium (up to 3,180 mg/kg) exceeded the sensitive ecosystem / residential criteria in the shallowest interval at LOB04-02, and in the deepest intervals sampled in LOB04-01, LOB04-03, and LOB04-05.[677]

593. **Mono 1-5 / CPF**: Within the areas investigated by Ramboll, the prior barium and/or lead exceedances were not fully delineated vertically or horizontally. After additional sampling around three main areas:[678]

(a) The area north of the platform (not associated with an identified REC; located southwest of API oil/water separator discharge which was observed to overflow during heavy rain events) was further investigated by samples at borings MON01-01 through MON01-04. Petroleum odor was encountered within subsurface soils at MON01-02. Barium (up to 1,400 mg/kg) exceeded the sensitive ecosystem / residential criterion at MON01-03.

(b) The area east of the platform (REC 105; former wells/pits) was further investigated by samples at borings MON01-05 through MON01-10. Barium (up to 1,840 mg/kg) exceeded the sensitive ecosystem / residential criterion to the south and lead (up to 161 mg/kg) exceeded the applicable criterion to the north and south. In addition, at certain isolated locations, chromium (78 mg/kg), nickel (57.9 mg/kg) and vanadium (153 mg/kg) were detected above the applicable criteria at MON01-08.

(c) The area south of the platform (not associated with an identified REC; reported historical spills from southeastern oil trap) was further investigated by samples

677 *Ibid.*, pp. 88-89.

678 *Ibid.*, p. 89.

at borings MON01-11 through MON01-23. Petroleum odor was noted in subsurface soils at MON01-11, so TPH analysis was added at this location. TPH did not exceed the sensitive ecosystem / residential criterion in any of the samples. Barium (up to 1,280 mg/kg) and lead (up to 88.7 mg/kg) exceeded the applicable criterion in the northern portion of this sampling area. At certain isolated locations, chromium (up to 138 mg/kg), nickel (up to 56.2 mg/kg) and vanadium (up to 183 mg/kg) were also detected above the applicable criteria.

594. **Mono Sur**: Within the areas investigated by Ramboll, the prior barium and lead exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: The area to the northeast of the mapped mud pit and in the discharge area of an oil/water separator (not associated with a specific REC) was further investigated by samples at borings MON06-01 through MON01-06. Barium (up to 595 mg/kg) exceeded the sensitive ecosystem / residential criterion to the east, but lead did not exceed the applicable criterion in any of the samples. Chromium (up to 83.1 mg/kg), nickel (up to 46.7 mg/kg) and vanadium (up to 148 mg/kg) were also detected above the applicable criteria at most boring locations.[679]

595. **Oso 1 / CPF**: Within the areas investigated by Ramboll, the prior barium exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: The storm water management feature south of the platform (not associated with a specific REC) was delineated by samples at borings OSO01-01 through OSO01-06. Barium (up to 3,870 mg/kg) exceeded the industrial criterion at two borings within the feature.[680]

596. **Oso A**: Within the areas investigated by Ramboll, the prior barium exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: The area west of the platform (REC 250; oil-water separator discharge) was delineated by samples at borings OSOA-01 through OSOA-05. Petroleum odor and / or staining was

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679 *Ibid.*, pp. 89-90.

680 *Ibid.*, p. 90.

encountered in subsurface soils at OSOA-01 and OSOA-02. Consequently, TPH analysis was added for samples at this site. However, neither TPH nor barium exceeded the applicable industrial criteria167 in any of the samples.[681]

597. **Payamino 1 / CPF**: Within the areas investigated by Ramboll, the prior barium and TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around four main areas:[682]

(a) Soils on the CPF adjacent to the power oil pump building (area not associated with a specific REC) were delineated by samples at borings PAYCPF-01 through PAYCPF-03. Petroleum odor and staining were noted in subsurface soils at PAYCPF-01 and PAYCPF-02. However, TPH did not exceed the industrial criterion in any of the samples.

(b) The swampy area furthest to northwest of the CPF (area not associated with a specific REC) was further investigated by samples at borings PAY01-01 through PAY01-05, PAY01-16 and PAY01-17. TPH did not exceed the sensitive ecosystem / residential criterion in any of the samples. However, barium (up to 812 mg/kg) exceeded the applicable criterion to the west and northwest. At one location, chromium (up to 69 mg/kg) was also detected above the applicable criterion.

(c) TPH and barium in the catchment basin (not associated with a specific REC) was delineated by samples at borings PAY01-06 through PAY01-8, PAY01-10 and PAY01-18, generally located outside the top of the catchment area. Petroleum odor, staining and "beads" of product were noted in shallow subsurface soils during drilling of monitoring well PAY01-MW02 within this basin area. However, neither TPH nor barium exceeded the sensitive ecosystem / residential criteria in any of the samples. Vanadium (up to 145 mg/kg) exceeded the applicable criterion at one location. The area adjacent to the concrete pit (REC

681 *Ibid.*, pp. 90-91.

682 *Ibid.*, pp. 91-92.

135) was delineated by samples at borings PAY01-11 through PAY01-15. Petroleum odor and / or staining were encountered in subsurface soils at PAY01-12, PAY01-14 and PAY01-21. However, TPH did not exceed the applicable criterion in any of the samples.

598. **Payamino 2 / 8**: Within the areas investigated by Ramboll, the prior barium and TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: The swampy area (REC 351) was further investigated by samples at borings PAY02-01 through PAY02-16. What appeared to be weathered crude was observed at the surface northeast of the platform between the platform and swampy area. At PAY02-01 and PAY02-02, petroleum staining was observed at the surface, and petroleum odor, staining and beads of free product were noted in subsurface soils and water at these same locations. Petroleum odor and staining were also noted in subsurface soils at PAY02-04. However, TPH did not exceed the sensitive ecosystem / residential criterion in any of the samples. Barium (up to 5,810 mg/kg) exceeded the sensitive ecosystem / residential criterion in the deepest interval sampled and to the south, west, north and northwest of the area investigated. At certain isolated locations, cadmium (up to 1.68 mg/kg), chromium (up to 102 mg/kg), lead (up to 182 mg/kg) and vanadium (up to 144 mg/kg) exceeded the applicable criteria. Generally, the data gathered better defined the limits of soil impacts and make clear that the depth of such impacts is significantly greater than the Parties previously believed.[683]

599. **Payamino 3**: Within the areas investigated by Ramboll, the prior TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around two main areas:[684]

(a) Soils on the southern corner of the platform (not associated with a specific REC) were delineated by samples at borings PAY03-01 through PAY03-04. TPH was not detected above the industrial use criterion in any of the samples.

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683 *Ibid.*, p. 92.

684 *Ibid.*, pp. 92-93.

(b) A soil stockpile (not associated with a specific REC) was characterized by boring PAY03-05. The sample collected to further characterize this pile was analyzed for TPH and metals. Neither TPH nor metals exceeded the industrial use criteria in any of the samples.

600. **Payamino 4 and 14 / 20 / 24**: Within the areas investigated by Ramboll, the prior barium and TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around two main areas:[685]

(a) The area northeast of the Payamino 4 platform (REC 114; historical spill) was delineated by samples at borings PAY04-07 through PAY04-12. Petroleum odor was encountered in subsurface soils at borings PAY04-09, PAY04-10 and PAY04-12. However, TPH did not exceed the applicable criterion in any of the samples. Barium (up to 5,810 mg/kg) exceeded the industrial criterion at PAY04-12. Cadmium (up to 2.08 mg/kg) and lead (up to 120 mg/kg) also exceeded the applicable criteria at this location. Chromium (up to 153 mg/kg) and vanadium (up to 181 mg/kg) exceeded the applicable criteria at PAY04-10.

(b) The area southwest of the mud pit (REC 113), where prior sampling by the Parties detected the highest TPH concentrations in soil of any site (124,873 mg/kg), was further investigated by samples at borings PAY04-01 through PAY04-06. What appeared to be weathered crude at the surface and petroleum odor and staining in subsurface soils were encountered at PAY04-01. However, TPH did not exceed the sensitive ecosystem / residential criterion in any of the samples. Barium (up to 1,990 mg/kg) exceeded the applicable criterion in areas to the northwest and southwest of the area investigated. Cadmium (up to 4.9 mg/kg) also exceeded the applicable criterion to the south and southwest of the area investigated.

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685 *Ibid.*, p. 93.

601. **Payamino 10**: Within the areas investigated by Ramboll, the prior barium exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: Barium in soils in the southwestern portion of platform area (not associated with a specific REC) was delineated by samples at borings PAY10-01 through PAY10-04172 as barium did not exceed the industrial criterion in any of the samples. Vanadium (up to 181 mg/kg) exceeded the applicable criterion in areas to the northwest and south.[686]

602. **Payamino 15**: Within the areas investigated by Ramboll, the prior vanadium exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: The area east of the former power oil pump building (not associated with a specific REC) was delineated by samples at borings PAY15-01 through PAY15-03. Vanadium did not exceed the industrial use criterion in any of the samples.[687]

603. **Payamino 16**: Within the areas investigated by Ramboll, the prior barium exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: Barium in soils near the Payamino 16 well (not associated with a specific REC) was delineated by samples at borings PAY16-01 through PAY16-03 as barium did not exceed the sensitive ecosystem / residential criterion in any of the samples. However, vanadium (up to 143 mg/kg) exceeded the applicable criterion at all boring locations.[688]

604. **Payamino 21**: Within the areas investigated by Ramboll, the prior TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: The area northwest of the diesel tank (REC 221; possible discharge from diesel tank) was delineated by samples at borings PAY21-01 through PAY21-04. TPH did not exceed the industrial criteria in any of the samples.[689]

605. **Payamino 23**: Within the areas investigated by Ramboll, the prior barium exceedances were not fully delineated vertically or horizontally. After additional sampling around one

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686 *Ibid.*, p. 94.

687 *Ibid.*, p. 94.

688 *Ibid.*, pp. 94-95.

689 *Ibid.*, p. 95.

main area: The area east of the platform (REC 234; oil-water separator discharge) was further investigated by samples at borings PAY23-01 through PAY23-07. Petroleum odor and / or staining were noted in subsurface soils at PAY23-01 and PAY23-02. However, TPH did not exceed the sensitive ecosystem / residential criterion in any of the samples. Barium (up to 7,500 mg/kg) exceeded the applicable criterion to the south, east and north of the area investigated. Vanadium (up to 155 mg/kg) also exceeded the applicable criterion in all directions around this area. At one isolated location, lead (up to 89.6 mg/kg) was detected above the applicable criterion.[690]

606. **Payamino WTS / LF**: Within the areas investigated by Ramboll, the prior barium and TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around three main areas: TPH and barium in soils in areas north, east and south of the mud pit (REC 305) were delineated by samples at borings PAYWTS-01 through PAYWTS-06 as neither TPH nor barium exceeded the industrial use criteria in any of the samples. However, vanadium (up to 143 mg/kg) exceeded the applicable criterion in all boring locations.[691]

607. **Punino**: Within the areas investigated by Ramboll, the prior TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around three main areas: TPH in the area west of the platform (not associated with an identified REC; located near oil-water separator discharge) was delineated by samples at PUN01-01 through PUN01-04 as TPH did not exceed the sensitive ecosystem / residential criterion in any of the samples.[692]

(ii) Block 21

608. For Block 21, Ramboll's findings were as follows.[693]

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690 *Id.*

691 *Ibid.*, pp. 95-96.

692 *Ibid.*, p. 96.

693 *Ibid.*, Section 5.3.3.2.

609. **Chonta**: Within the areas investigated by Ramboll, the prior TPH exceedances to the south of the site were not fully delineated vertically or horizontally. After additional sampling around one main area: The soil pile and raised area in the vicinity of Mud Pit 5 (REC 281; allegedly an unclosed mud pit) were further investigated by samples at borings CHON-01 through CHON-03. Petroleum odor and staining were noted in subsurface soils at CHON-02 and CHON-03, so TPH analysis was also performed on samples collected at this site. However, TPH did not exceed the sensitive ecosystem / residential criterion in any of the samples. Barium (5,250 mg/kg) exceeded the applicable criterion at CHON-02. Cadmium (1.54 mg/kg) at CHON-01 and nickel (63.9 mg/kg) at CHON-03 also exceeded the applicable criteria. Previously detected barium appears to be in a limited portion of the soil pile and the sampling results at the other two locations do not appear representative of mud pit material.[694]

610. **Nemoca**: Within the areas investigated by Ramboll, the prior TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: The area southwest of the platform (not associated with an identified REC; located near oil-water separator discharge) was delineated by samples at NEM01-01 through NEM01-05. TPH did not exceed the sensitive ecosystem / residential criterion in any of the Ramboll samples.[695]

611. **Yuralpa A**: Within the areas investigated by Ramboll, the prior barium exceedances were not fully delineated vertically or horizontally. After additional sampling around three main areas: The area southeast of the platform (not associated with a specific REC; located adjacent to an oil-water separator discharge) was further investigated by samples at borings YURA-01 through YURA-05. With the exception of a barium (up to 2,410 mg/kg) exceedance of the applicable criterion to the northeast of the area investigated, the area is largely delineated.[696]

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694 *Ibid.*, pp. 96-97.

695 *Ibid.*, p. 97.

696 *Ibid.*, p. 97.

612. **Yuralpa D**: Within the areas investigated by Ramboll, the prior nickel exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: Nickel in soils near the Yuralpa Pad D well (REC 291; possible discharges from wellheads) were delineated by samples at YURD-01 through YURD-04 as nickel was not detected above the industrial use criteria in any of the samples.[697]

613. **Yuralpa CPF**: Within the areas investigated by Ramboll, the prior TPH exceedances were not fully delineated vertically or horizontally. After additional sampling around one main area: Soils beneath a gravel parking area at the Yuralpa CPF (not associated with a specific REC) were further investigated by samples at YURCPF-01 through YURCPF-05. TPH was not detected above the industrial use criterion in any of the samples.[698]

10. Remedial requirements

(a) Conceptual Remedial Plans

614. Mr. MacDonald identified and evaluated potential soil, mud pit and shallow groundwater remedial alternatives with reference to four primary criteria: demonstrability, technical feasibility, regulatory acceptance, and permanence. Considering site-specific characterisation of affected media as well as other environmental conditions, a remedial technology was excluded from further consideration if it:[699]

(a) Was not generally accepted under TULAS or RAOHE;

(b) Was not well-established;

(c) Necessitated installation of a new significant, reliable and continuous power source;

(d) Was ineffective;

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697 *Ibid.*, pp. 97-98.

698 *Ibid.*, p. 98.

699 *Ibid.*, Section 6.3.1.

(e) Required highly specialised equipment that was not locally available; or

(f) Would not meet the remedial objectives.

615. Following this screening process, Mr. MacDonald ranked the retained alternatives by considering their short-term effectiveness (*i.e.*, risks to human health and the environment during remedy implementation), long-term effectiveness (*i.e.*, risks to human health and the environment following remedy implementation), implementability (*i.e.*, ease, reliability, and flexibility of implementation considering site constraints) and relative costs. For each criterion, the technologies were scored relative to each other and the cumulative scores were totaled, weighted, and compared to define preferred options (*i.e.*, the alternatives with the highest scores). Mr. MacDonald's preferred remedial options for each target medium are set out in Table 6.2 to his Report, which is reproduced below:

Table 6.2: Selected Remedial Alternatives	
Nonconforming Media	Retained Remedial Alternatives
Soil (TPH exceedances only)	Ex-situ Treatment (landfarming)[d] Excavation, Treatment and On-Site Containment[d,e] Excavation, Treatment and Off-Site Disposal
Soil (metal exceedances with or without TPH exceedances)	Excavation, Treatment and On-Site Containment[e] Excavation, Treatment and Off-Site Disposal
Mud Pits	In-situ Treatment[f] and Capping Mud Pit Rehabilitation/Lining, On-site Disposal and Capping (per RAOHE Article 59)[g] Mud Pit Rehabilitation/Lining, Material Treatment[h], On-site Disposal and Capping (per RAOHE Article 59) Excavation and Treatment and Off-Site Disposal
Ground water	Pump and treat system[h] Permeable reactive barrier[i]

Notes:
[a] Ex-situ refers to remedial action following removal at a designated on-site or central area.
[b] In-situ refers to remedial action in place, without the need for excavation and transport to a designated on-site or central area.
[c] On-site refers to a location within the facility or a nearby facility. Off-site refers to a third-party location outside the facility.
[d] This alternative could include consolidation of TPH impacted soils from various sites in a central area and management as a single media.
[e] This alternative could include consolidation of nonconforming soils with nonconforming mud pit materials and management of both as a single media.
[f] In-situ treatment only refers to liming to adjust pH.
[g] For mud pit materials not conforming to the unlined performance criteria but meeting the lined performance criteria.
[h] Mud pit treatment could include mixing with reagents such as Portland cement, borrow soils, and/or lime.
[i] This alternative is only viable at continuously manned sites where there is an existing power source and means for storage and treatment of extracted ground water.
[j] The permeable reactive barrier is typically placed in the downgradient side of an affected ground water area. However, given the predicted relatively low potential for contaminant migration for most sites, such a PRB would not be effective in addressing groundwater contamination as the PRB relies on sufficient water flowing through the reactive media. A variation of this alternative would involve placement of reactive media (to oxidize or reduce contaminants) at the base of proposed excavations within such areas where groundwater sampling has identified contamination.

616. Mr. MacDonald considered that the conceptual remedy selection for soils conforms to paragraph 4.1.3.6 and 4.1.3.7 of TULAS Annex 2, Book VI, while that for mud pits conforms to Articles 52(d)2.3 and 59(b) of RAOHE. These define generally accepted remedial approaches by the Ministry of the Environment in Ecuador and establish specific performance criteria. Further, in defining the conceptual remedial approach the following factors were considered:

(a) Each site was considered in its entirety, such that the selected remedial plan would address all affected media.

(b) The remedial approach considered for a specific area considered other remedial activities at the site such that the least number of remedial technologies would be implemented to simplify implementation.

(c) If water was to be removed (*e.g.*, dewatering of excavation, dewatering of swampy soils), it was assumed that two modular temporary water treatment systems would be used and shared between sites.

(d) If remedial action was to be implemented in swampy areas requiring dewatering to allow construction in "dry conditions" or to manage surface water, it was assumed that a temporary and reusable dam system would be used.

617. Mr. MacDonald considered that these factors would allow for remedy optimisation and/or reduced implementation costs.

(b) Cost Estimates

618. Mr. MacDonald then developed site-specific cost estimates for the selected conceptual remedial alternative to address affected media at each site using standard engineering methods which incorporated local unit costs, where available.[700] Remedial cost estimates were developed in general conformance with the USEPA and USACE guidelines. These are detailed in Appendix I to his Report. Mr. MacDonald acknowledged that the accuracy

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700 *Ibid.*, Section 6.3.3.

of estimates at the conceptual remedy design stage would be expected to be less than that of estimates developed at subsequent design stages, nevertheless, for most sites, he considered that the available data was adequate to develop reasonable estimates of remedial costs for the site-specific remedial plans.[701] Where the data was incomplete (*e.g.*, partial or incomplete horizontal and/or vertical delineation), higher contingencies were used to account for scope uncertainty.

619. The quantities used in the development of the remedial costs were mostly defined based on delineated or inferred horizontal and vertical extents of soil contamination, mapped mud pit dimensions, and projected groundwater impairment. Where contamination was identified but not completely delineated or characterised, the Expert employed "order of magnitude" remedial estimates. For certain remedial activities where quantities (*e.g.*, excavation dewatering volume, reagent quantities required to meet remedial goals, depth of permeable reactive barriers, mud pit configuration), material properties (*e.g.*, water content or density of excavated materials, swell and shrink ratios for materials) or duration of treatment process (*e.g.*, landfarming) could not be fully defined, these factors were assumed based on site-specific conditions and the Expert's professional experience with similar projects.

620. Unit costs and production rates used in the remedial cost estimates were defined from a combination of: (i) quotes obtained from remedial contractors in Ecuador; (ii) quotes obtained from United States suppliers of materials (*i.e.*, reagents) with experience in Ecuador; (iii) verified unit rates previously obtained by the Parties; and (iv) published remedial unit costs in the United States (*e.g.*, RS Means, RACER) adjusted through the use of location indices. While some local contractors did not provide definitive quotes in the absence of a detailed project scope, site details, and the possibility of a site visit, Mr. MacDonald believed that the unit pricing estimated that he used was adequate for overall

[701] These estimates were based on conditions known at the time of the Report's writing. With completion of pre-design investigations and the remedial design activities, adjustments to these estimates were possible.

cost projections. The unit pricing used in the cost estimates was inclusive of labor, equipment, materials, and overhead and profit, unless otherwise indicated.

621. In developing the remedial cost estimates, the remedial process was subdivided into major construction tasks, which where were further subdivided as appropriate:

(a) **Pre-Construction Activities:** These include additional pre-design investigation activities to better define remedial quantities and assess the extent and magnitude of groundwater impacts, environmental permitting to allow implementation of the proposed remedial actions and their design. Related Costs were allocated proportionally to the soil, mud pit and groundwater remedial estimates.[702]

(b) **Site Preparation:** These include *inter alia* equipment and material mobilization to prepare sites for remedial works. Related costs were allocated proportionally to the soil, mud pit and groundwater remedial estimates.[703]

(c) ***Ex-Situ* Treatment of Soils – Landfarming:** *Ex-situ* soil treatment through landfarming is only applicable to soils affected by TPH and ultimately leads to backfilling of the treated soils and restoration of disturbed areas.[704]

(d) **Soil Excavation, Treatment and Disposal:** This involves the excavation, treatment and disposal activities in non-mud pit areas. Excavated materials would be treated by stabilisation/solidification (*i.e.*, mixing with reagents such as Portland cement, borrow soils, and/or lime) if impacted by metals (with or without TPH) or TPH alone.[705]

(e) **Mud Pit Remediation:** There are three potential alternatives depending on the extent of conformance to the RAOHE performance criteria. Specifically, (i) mud pit materials that do not meet the performance criteria for lined mud pits would be

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702 Independent Expert Report, p. 135.

703 *Ibid.*, p. 135.

704 *Id.*

705 *Ibid.*, pp. 135-136.

treated and placed in reconstructed lined mud pits, (ii) mud pit materials that only fail to meet the unlined mud pit performance criteria would be placed in reconstructed lined mud pits, and (iii) mud pit materials not conforming to the unlined pH criteria in RAOHE would be treated *in-situ*. In all cases, the integrity of the closed mud pit would need to be ensured through periodic maintenance (mowing) and use of the mud pit area restricted through installation of a perimeter fence if one does not already exist.[706]

(f) **Groundwater Remediation:** In areas where soil/mud pit and groundwater sampling have identified collocated contamination, groundwater remediation activities are integrated with soil or mud pit remediation activities. In the few cases where there is potential for a higher degree of groundwater contaminant migration, groundwater remediation would consist of installation of a permeable reactive barrier. This passive groundwater treatment system would not require operation and maintenance but would require periodic monitoring to document the effectiveness of the treatment system.[707]

(g) **Construction Management**: These relate to the oversight and documentation of the remedial action and the reporting of the work performed. Associated costs were allocated proportionally to the soil, mud pit and groundwater remedial estimates.[708]

(h) **Contingency:** Contingency costs were defined based on how well the scope of the proposed remedy could be defined and ranged from 10% to 30% depending on complexity and certainty. These were allocated proportionally to the soil, mud pit and groundwater remedial estimates.[709]

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706 *Ibid.*, p. 136.

707 *Id.*

708 *Id.*

709 Independent Expert Report, p. 136.

(i) **Recurring Costs:** These include long-term maintenance and monitoring costs, applied after remedy implementation. Certain remedies would require periodic physical inspections and site maintenance. For groundwater remedies, annual groundwater monitoring for 10 years to document treatment effectiveness have been considered. While the cap maintenance activities will be required in perpetuity, for estimating purposes, these costs are assumed to span 30 years.[710]

622. In addition, based on experience of local contractors that recently conducted remedial work on behalf of Petroamazonas in the region, a labor cost multiplier of three to five was applied to those projects to address health and safety and community relations requirements imposed by Petroamazonas, which affect remedial work productivity and effectiveness. This factor also accounts for the potential for added security necessary for implementation of the work. In the absence of detailed cost breakdowns or defined durations for all construction activities, Ramboll could not reliably determine the degree to which such a factor should be applied in its remedial cost estimations. Ramboll believed that this factor may be partially offset by the applied contingencies and the conservative assumptions used in defining remedial quantities.[711] Quantity and costs are set out at Tables 6.3 to 6.10 of the Independent Expert Report.

(c) Summary of Cost Estimates

623. Based on Mr. MacDonald's consideration of the conceptual remedial plans and possible viable remediation methods and the associated costs, Mr. MacDonald considered that the estimates of probable remedial costs for the site-specific remedial plans were reasonable.

624. Based on these conceptual remedial plans, Ramboll developed site-specific cost estimates using standard cost estimating methods and in general conformance with the USEPA and USACE guidelines:[712]

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710 *Ibid.*, p. 137.

711 *Id.*

712 Independent Expert Report, p. 150.

(a) Remedial quantities were mostly defined based on delineated or inferred horizontal and vertical extents of soil contamination, mapped mud pit dimensions, and degree of predicted groundwater impairment. In cases where impacts were identified but not completely delineated or characterized, order of magnitude remedial estimates were provided.

(b) For certain remedial quantities or material properties, assumptions were made based on site-specific conditions and professional experience with similar projects.

(c) Unit costs and production rates used in the remedial cost estimates were defined from a combination of: (a) quotes obtained from remedial contractors in Ecuador; (b) quotes obtained from United States suppliers of materials with experience in Ecuador; (c) verified unit rates previously obtained by the Parties; and (d) published remedial unit costs in the United States (*e.g.*, RS Means, RACER), adjusted using location indexes.

(d) For complex sites (*e.g.*, presence of underground pipelines, steep slopes, limited access, work within swamps), higher contingencies were applied to account for scope uncertainty.

625. These are set out in Table 6.11 of his Independent Expert Report:

Table 6.11: Summary of Remedial Cost Estimates

Site	Estimated Remedial Cost			
	Soils	Mud Pits	Groundwater	Total
Coca 01	$788	-	-	$788
Coca 02, CPF	$2,700	-	$3,001	$5,701
Coca 04	$308	-	-	$308
Coca 06	$5,223	-	-	$5,223
Coca 08	$10,055	-	-	$10,055
Coca 09	$805	-	-	$805
Coca 10, 16	$781	-	-	$781
Coca 18, 19	$406	$3,123	-	$3,529
Cóndor Norte	$6,339	$2,484	-	$8,823
Gacela 01, CPF	$2,103	-	$1,397	$3,500
Gacela 02	$1,575	-	$597	$2,172
Gacela 04	$195	-	-	$195

Table 6.11: Summary of Remedial Cost Estimates				
Site	Estimated Remedial Cost			
	Soils	Mud Pits	Groundwater	Total
Gacela 05	$247	-	-	$247
Jaguar 01	$3,104	-	$438	$3,542
Jaguar 02	$8,505	-	$1,173	$9,678
Jaguar 03	$5,643	-	-	$5,643
Jaguar 05, CPF	$379	-	-	$379
Jaguar 07, 08	$323	-	-	$323
Jaguar 09	-	$541		$541
Lobo 01	$1,361	-	-	$1,361
Lobo 03	-	$101	-	$101
Lobo 04	$717	-	-	$717
Mono CPF	$15,773	-	$5,030	$20,803
Mono Sur	$1,281	-	-	$1,281
Oso 01, CPF	$186	-	-	$186
Oso 03	-	$1,906	-	$1,906
Oso 09	-	$5,317	$3,415	$8,732
Oso 09A	-	$2,948	-	$2,948
Oso 09B	-	$1,507	-	$1,507
Oso A	$228	-	-	$228
Payamino 01, CPF	$4,746	-	$1,404	$6,150
Payamino 02, 08	$15,316	-	$4,343	$19,659
Payamino 03	$110 - $129	-	-	$110 - $129
Payamino 04, 14	$3,411	-	$1,611	$5,022
Payamino 10	$313	-	-	$313
Payamino 13	-	-	$1,166	$1,166
Payamino 15	-	-	$1,166	$1,166
Payamino 16	-	-	-	
Payamino 21	$155	-	-	$155
Payamino 23	$1,765	-	-	$1,765
Payamino WTS	$1,493	$2,978	-	$4,471
Punino	$121	-	-	$121
Chonta	$645	$1,404	-	$2,049
Nemoca	$530	-	-	$530
Yuralpa A	$202	$1,034	-	$1,236
Yuralpa CPF	$98	-	-	$98
Yuralpa D	$475	-	-	$475
Yuralpa E	-	$193	-	$193
Yuralpa G	-	$963	-	$963
Yuralpa LF	-	$12,217	-	$12,217
TOTAL	**$98,423**	**$36,715**	**$24,742**	**$159,881**

Table 6.11: Summary of Remedial Cost Estimates				
Site	Estimated Remedial Cost			
	Soils	Mud Pits	Groundwater	Total
Notes: 1. For purposes of this summary table, the higher cost values for any given range for Nemoca, Payamino 21, Punino, Yuralpa CPF, and Yuralpa LF were used.				

11. Opinions Regarding the Technical Findings in the Blocks

626. Mr. MacDonald's key conclusions and opinions regarding the comprehensive technical findings in the Blocks are as follows:[713]

(a) The field work conducted by Ramboll significantly enhanced the body of knowledge and technical platform with respect to contamination across the sites in Blocks 7 and 21 and serves as a credible basis to determine unbiased and independent cost estimates.

(b) The comprehensive mud pit investigation shows that a large percentage of mud pits in the Blocks do not meet the performance standards in RAOHE and require remediation.

(c) Representative data obtained from all of the investigated platforms in the Blocks shows that groundwater has been impaired by oilfield operations and requires remediation.

(d) The comprehensive soil investigation adequately defined the extent of oilfield-related impacts at the Blocks that require remediation. The data gathered was sufficient to reasonably define remedial quantities.

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713 *Ibid.*, Section 7.

(e) The analytical tools and guiding principles used to define media-specific remedial requirements are consistent with Ecuador's regulations, professional practices, and the Tribunal's direction.

(f) Remedial options for affected media were systematically evaluated to pre-select locally available, demonstrated, implementable and cost-effective alternatives that conform to generally accepted remedial approaches described in TULAS or RAOHE. The remedial options were then assembled into site-specific conceptual remedial plans to address the affected media. Associated remedial cost estimates were developed using standard cost estimating methods that incorporate unit costs from local contractors, published remedial unit costs adjusted using location indexes.

E. The Parties' Comments

627. Following the transmission of Mr. MacDonald's Report to the Parties, the Tribunal permitted the Parties to make two forms of written submissions on the Report, to request certain documents of each other, and to make oral submissions and pose questions to the Expert at a two-day hearing held in The Hague on 11-12 March 2019.

628. In relation to the written materials, the Parties were instructed to annotate the Independent Expert Report by providing focused comments on each main part of the Report. Their comments were thus inserted into a "**Consolidated Expert Report**." In addition, the Parties were invited to file general comments on the Report in a separate written submission not to exceed 30 pages.

629. After these documents were filed on 22 February 2019, they were transmitted to Mr. MacDonald for his review. On Day 1 of the Expert Hearing, Mr. MacDonald gave a 90-minute presentation to the Parties and the Tribunal in which he explained his key findings and responded to the Parties' written comments. The Parties were then each given two hours to cross examine him.

630. This was followed by a witness conferencing session wherein Mr. MacDonald was paired first with a representative of IEMS and then with a representative of GSI. Each Party was permitted to put questions to the two experts. On Day 2, the Parties were once again permitted to put questions to Mr. MacDonald and then to make closing submissions on the Independent Expert's work.

1. Ecuador's Observations on the Independent Expert's Findings

631. Ecuador observed that Mr. MacDonald limited himself to a single "data gap filling" sampling campaign, consistent with the Tribunal's mandate.[714] In Ecuador's view, the Independent Expert employed best and current industry practices throughout his field campaign. His Report confirms Ecuador's position that extensive and widespread environmental harm was left behind by Perenco in Blocks 7 and 21, and that Perenco was not a diligent and prudent operator that acted in full compliance with Ecuadorian environmental regulations.[715] Mr. MacDonald has closed significant data gaps and estimated higher remediation volumes and costs for said contamination than Perenco's experts and effectively vindicated Ecuador's position that contamination extends beyond the sampled points and that the use of predictive modelling software (as used by IEMS) to estimate the full extent of contamination in the Blocks was justified.[716]

632. Following Mr. MacDonald's findings and conclusions, and on the basis of newly-available data, Ecuador updated its claims for such sites where Mr. MacDonald has confirmed additional remedial volumes and costs compared to its "regulatory case":[717]

(a) <u>Soil remediation costs:</u>

i. Coca 10/16: at least US$781,000;
ii. Jaguar 1: at least US$3,104,000;
iii. Jaguar 5/CPF: at least US$379,000;
iv. Lobo 4: at least US$717,000;
v. Oso A: at least US$228,000;

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714 Ecuador's Comments to the Independent Expert Report dated 22 February 2019, paragraph 4.

715 *Ibid.*, paragraph 1.

716 *Ibid.*, paragraph 9.

717 *Ibid.*, paragraph 31.

vi. Payamino 23: at least US$1,765,000; and
vii. Yuralpa F/CPF: at least US$98,000.

(b) Groundwater remediation costs:

i. Mono CPF: at least US$5,030,000;
ii. Oso 9: at least US$3,415,000; and
iii. Payamino 2/8: at least US$4,343,000.

633. At the same time, Ecuador argued that Mr. MacDonald did not capture the full extent of the contamination caused by Perenco, and has estimated only the minimum required remedial needs arising out of what it called Perenco's "*reckless operations*."[718] Ecuador's comments on specific aspects of Mr. MacDonald's investigation are set out below.

(a) Soil

634. Ecuador considers that Mr. MacDonald's investigation of soil contamination was generally in compliance with the Tribunal's mandate.[719]

635. First, Mr. MacDonald restricted the sampling campaign to previously sampled areas. Insofar as Perenco criticises Mr. MacDonald for sampling outside of his mandate, Ecuador argues that the Tribunal's instruction that "*[t]o the extent that the areas surrounding those points of contamination were not delineated […] that process of delineation must now occur*"[720] was complied with when Mr. MacDonald stepped away approximately 10 to 15 metres from the Parties' samples to collect additional samples in a soil pile a few metres to the east of Perenco's auxiliary (and contaminated) pits at Coca 18/19.[721]

636. Second, in Ecuador's opinion, Mr. MacDonald's reliance on discrete soil samples (of intervals of less than 0.3 m) for delineation purposes allowed him to capture the highest concentrations of contaminants within each sampled interval. This resulted in higher

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718 *Ibid.*, paragraph 4.
719 *Ibid.*, paragraph 10.
720 *Ibid.*, paragraph 11 & fn. 33, referring to Interim Decision on Counterclaim, paragraph 601.
721 *Ibid.*, paragraph 11.

remediation volumes, in contrast to GSI's vertical 1-metre composites which underestimated contamination through dilution.

637. Ecuador observes that Mr. MacDonald adjusted the applicable criteria to account for background metals levels where there were likely natural concentrations of heavy metals. This resulted in the exclusion of hundreds of the Parties' samples as well as Mr. MacDonald's own delineation samples that showed the presence of vanadium and cadmium exceedances above the thresholds specified in RAOHE and TULAS.[722]

638. Turning to land use classifications, Ecuador defends Mr. MacDonald's methodology against Perenco's criticisms:

(a) First, contrary to Perenco's criticism that Mr. MacDonald relied on visual inspections for land use designations, he did not.[723] In any event, Perenco's own experts limited their land use designations assessment to visual inspection.[724]

(b) Second, Mr. MacDonald could not be faulted by Perenco for looking at actual land use when that was Perenco's case all along.[725]

639. However, Ecuador itself raised a number of criticisms of Mr. MacDonald's soil remediation estimates.

640. First, even though Ecuador acknowledges that Mr. MacDonald's guidelines for land use classification were generally in line with the Tribunal's mandate to apply the more stringent land use designation, Ecuador argues that his classifications for certain locations were too permissive. Ecuador cites as examples the area to the northeast of the platform in Payamino 4 which had been reclassified as "industrial", and the classification of Coca 1 and Gacela 1/8 as "agricultural", even though the Consortium and prior operators acknowledged that

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722 *Ibid.*, paragraph 13.

723 Tr. (2) (MacDonald) (12 March 2019) 392:8-14; Ecuador's Closing Presentation, Slide 15.

724 Tr. (2) (MacDonald) (12 March 2019) 392:15-393:4, referring to page C36 of Appendix C to GSI ER I.

725 Tr. (2) (MacDonald) (12 March 2019) 393:5-19.

areas of water interaction were "sensitive."[726] Ecuador also argues that Lobo 1 should be remediated to a sensitive ecosystem standard, not agricultural, as it had been abandoned by Perenco and had not been operated by Petroamazonas, and this would be in line with Mr. MacDonald's remediation approach for other platforms which have not been operated since Perenco's abandonment.

641. Second, Ecuador criticises Mr. MacDonald's exclusion of three sites where soil exceedances above the applicable regulatory criteria were identified: Lobo 2 samples had barium exceedances, Payamino 5 samples had barium exceedances, and Payamino 19 samples had TPH exceedances.[727] Mr. MacDonald also excluded from his investigations seven other sites on the basis that Perenco had not drilled in those sites or Perenco-associated pits were not identified. However, Ecuador argues, it cannot be ruled out that Perenco's activities had taken place at these sites and they should have been investigated further.[728] Ecuador also argues that Mr. MacDonald should at the very least have delineated as orders of magnitude.[729]

642. Third, the Independent Expert's soil delineation was incomplete. Complete delineation was only performed at 12 sites. Ecuador points to Mr. MacDonald's acknowledgement of this point in his Report as well as at Expert Hearing.[730] To identify the full extent of vertical and horizontal contamination, sampling should continue until 'clean soil' was found; however, 239 out of 804 samples collected by Mr. MacDonald still were not 'clean'. Mr. MacDonald instead estimated the boundaries of contamination based on existing data and bounding conditions as well as field observations. An example of such incomplete delineation is Coca 8, where Mr. MacDonald's sampling still found contamination and

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726 Ecuador's Annotations to Section 3.1 of Independent Expert Report, Section 3.1, para 6.

727 Ecuador's Comments to the Independent Expert Report dated 22 February 2019, paragraph 34 and fn. 88.

728 Ecuador's Comments to Section 4.2 of Independent Expert Report, paragraph 1, referring to Ecuador's Comments to the Mud Pit Fact Sheet dated 22 September 2017.

729 Ecuador's Closing Presentation, Slide 13.

730 Ecuador's Closing Presentation, Slide 16, referring to Tr. (1) (MacDonald) (11 March 2019) 248:14-16.

where he assumed an average of 3-metre depth for remediation even though he acknowledged that exceedances were found at depths of up to 4.5 metres.[731]

643. Finally, Ecuador criticised Mr. MacDonald's decision to estimate "orders of magnitude" for remediation when data was insufficient. There was no guarantee that these estimates captured all contamination present in those areas. Once again, Ecuador relied on Coca 8 as an example where there was no reason to believe that Mr. MacDonald's estimate properly captured all contamination.

(b) Mud Pits

644. Ecuador observed that, contrary to Perenco's contention that it consistently followed good practices with respect to mud pits, the Expert found that the contents of 34 of 38 sampled Perenco-associated mud pits failed to conform with RAOHE criteria. All 12 of the investigated sites had at least one mud pit that did not comply with leachability standards and 11 of those sites also had at least one mud pit with inadequate cover material.[732]

645. With respect to Mr. MacDonald's decision to sample the Oso 9A and 9B off-site pits, which was criticised by Perenco as falling outside of his mandate, Ecuador argued that he was right to do so. Mr. MacDonald's decision to sample these pits was consistent with his mandate for three reasons: first, said pit area had been previously sampled in 2010 by IEMS; second, Perenco acknowledged having performed workovers at Oso 9 and drilling nearby wells and did not deny having used such pits; and third, GSI referred to sampling conducted by Perenco at the alleged time of the closure of these pits.[733]

646. Ecuador asserted that Mr. MacDonald properly verified the conformance of all mud pit leachate samples against the criteria in RAOHE Table 7 through the TCLP leachate test specified by RAOHE. Although Mr. MacDonald also used the SPLP method to "*qualitatively […] assess the potential for in-situ leaching of detected constituents in mud*

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731 Ecuador's Comments to the Independent Expert Report dated 22 February 2019, paragraph 38.

732 *Ibid.*, paragraph 16.

733 *Ibid.*, paragraph 18.

pit materials", he did not rely on SPLP results, as GSI "inappropriately" did, to assess compliance with RAOHE.[734]

647. Ecuador also argued that Mr. MacDonald's decision to treat all pits as unlined was justified, given that they constitute exposure pathways due to their depth and shallowness of the phreatic level (*i.e.*, shallow groundwater). This was all the more relevant considering the lack of evidence of liners in pits, as Mr. MacDonald pointed out.[735] Ecuador recalled that GSI had admitted that it "*didn't conduct a separate test regarding the presence or absence of synthetic liners*."[736] Even if Perenco had installed liners (which it has not established), there was no certainty that the liners fully extended beneath the pits and remained intact. Indeed, Perenco's own employees stated that the Consortium was careless when depositing drilling muds such that some liners cracked under the high temperatures.[737]

648. The liner issue aside, Ecuador had a number of criticisms about Mr. MacDonald's mud pit investigations.

649. First, Mr. MacDonald excluded from further investigation mud pits in 30 sites which he investigated on the basis that Perenco's use had not been identified.[738] However, there is evidence that drilling mud and/or other wastes may have been generated by Perenco at these sites, which indicates that Perenco must have used these mud pits, or that Perenco failed to demonstrate that these pits are properly closed. These mud pits should, thus, have been further investigated. This was particularly so, Ecuador contended, given Perenco's practice of building and using unreported pits (as admitted by Mr. Saltos to the *Burlington* tribunal) that were never approved or even known to the Ecuadorian authorities.[739]

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734 *Ibid.*, paragraph 19.

735 *Ibid.*, paragraph 20 & fn. 58.

736 *Ibid.*, paragraph 20 & fn. 59.

737 *Ibid.*, paragraph 20.

738 Ecuador's Comments to Section 4.2 of Independent Expert Report, paragraph 2, referring to Report's Table 4.3.

739 Ecuador's Comments to the Independent Expert Report dated 22 February 2019, paragraph 43.

650. Second, even within the 38 sites that were investigated, it is likely that the concentrations detected in the mud pit contents by Mr. MacDonald were underestimated. Further, given the uncertainty as to the actual dimensions of the pits investigated, these dimensions had to be estimated and Mr. MacDonald had to be cautious when sampling so as "not to penetrate the bottom of any mud pit,"[740] suggesting that the pits could, in fact, be deeper. In addition, when the depth of the mud pits was not available from the record, Mr. MacDonald assumed a depth of only 3.5 metres based on the average depth provided certain mud pit closure records. The evidence shows that this assumption, however, is insufficient to account for all the content of the pits needing remediation. For example, in Coca 18-19, 4 pits built by Perenco were 4.5 metres deep.

(c) Groundwater

651. Ecuador points out that contrary to GSI's conclusion that there was no groundwater contamination in the Blocks, the groundwater was impaired by oilfield operations above TULAS criteria for TPH and/or barium at all 12 sites investigated by Mr. MacDonald. This confirmed that groundwater was adversely affected by Perenco's oilfield operations and warrants remediation.

652. Mr. MacDonald's groundwater sampling campaign – which, Ecuador observed, was monitored by both Parties' experts – followed the highest industry standards, as confirmed by the fact that its results are consistent throughout the samples collected using different sampling methods (low-flow and RPPS).[741] Mr. MacDonald conducted his sampling through permanent monitoring wells installed in accordance with industry best practices and tested the resulting samples against the TULAS criteria. Ecuador argues that Mr. MacDonald vindicates IEMS' criticisms of GSI's tactics to elude confirmation of groundwater impacts in the Blocks.[742]

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740 Independent Expert Report, p. 48.

741 Ecuador's Comments to the Independent Expert Report dated 22 February 2019, paragraph 22.

742 *Ibid.*, paragraph 22.

653. First, Ecuador considers that Mr. MacDonald's groundwater monitoring well locations complied with the Tribunal's mandate. In arguing that Mr. MacDonald's sampling rationale was not be faithful to this mandate, Perenco misunderstands the mandate and the objective pursued. As explained by the Expert, an "*exact duplication of the program previously implemented by the Parties would have provided a poor data set that would not meet the Tribunal's objectives [and] would also have cost three times as much to execute*."[743] Further, only two monitoring wells, in Payamino 1 and Jaguar 2, are not immediately adjacent to a prior IEMS or GSI monitoring well – and the adjustments of these well locations were justified due to very high concentrations of TPH in soils at Payamino 1 and weathered crude oil at Jaguar 2.[744] In any event, an impact on groundwater was also identified at both sites in the monitoring wells that were installed in the vicinity of IEMS' and GSI's monitoring wells, thus requiring groundwater remediation regardless of the results of the monitoring wells whose location is criticized by Perenco.[745]

654. Second, Ecuador observes that Mr. MacDonald installed 34 state-of-the-art permanent pre-packed screened monitoring wells consistent with current industry practice to "*address the fine-grained subsurface conditions typically encountered in the Oriente Region of Ecuador"* and *"to improve the quality of the sample by reducing its turbidity and ensuring that samples collected from the well were representative of groundwater."*[746] Mr. MacDonald also took various precautions to prevent contamination from surface water encroachment. Perenco's allegation of potential soil contamination encroachment into the

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743 *Ibid.*, paragraph 25 and fn. 70, referring to Mr. MacDonald's 28 December 2017 letter to Perenco, p. 3, E-453.

744 *Ibid.*, paragraph 25 and fn. 72: MacDonald's 28 December 2017 letter to Perenco, p. 4 (PAY01-MW03 and JAG02-MW03 "were installed in areas where the Parties had previously collected soil samples, and where high levels of soil contamination were found by the Parties, but no wells had previously been installed […]. Evidence of crude oil was also apparent at JAG02-MW03. The lack of groundwater testing data within these two contaminated areas would represent a serious data gap that would limit my ability to assess whether groundwater contamination was present at these two affected sites."), E-453.

745 *Ibid.*, paragraph 25.

746 *Ibid.*, paragraph 26 & fns. 74-75, referring to the Independent Expert Report, pp. 66 and 68.

monitoring wells through surface waters flatly contradict GSI's position regarding the impermeability of clay soils in the area.[747]

655. Third, Ecuador also observes that Mr. MacDonald measured hydrocarbons in groundwater samples as per TULAS and duly considered – consistent with IEMS' approach – the sum of the GRO, DRO and ORO concentrations (whereas GSI compared the fractions individually against the TULAS limit).[748]

656. Fourth, Ecuador affirms Mr. MacDonald's decision not to filter groundwater samples which had been obtained using Rigid Porous Polyethylene (RPP) passive samplers and low-flow sampling techniques. Notwithstanding Perenco's objections, Mr. MacDonald's decision not to filter the samples was further corroborated by the similar analytical results obtained for metals in passive and low-flow samples.[749]

657. Fifth, Mr. MacDonald's decision not to exclude groundwater remediation based on soil clay content is supported by TULAS. Ecuadorian regulations do not indicate that groundwater in soils with greater than 25% clay and 10% organic matter should not be remediated.[750] In any event, there is no available information regarding the organic matter in the samples, hence, the cumulative conditions would not be met. Mr. MacDonald's decision is justified by the fact that he was able to extract groundwater from all monitoring wells, confirming that the presence of clay in soil (even greater than 25%) does not make soils impermeable. This confirms the high probability of that contaminated groundwater is being used for drinking purposes by nearby communities and the need to ensure that such groundwater is properly remediated.[751]

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747 *Ibid.*, paragraph 26.

748 *Ibid.*, paragraph 27.

749 *Ibid.*, paragraph 28.

750 *Ibid.*, paragraph 29.

751 *Ibid.*, paragraph 29.

658. In its closing submissions, Ecuador asserted that Perenco's argument, namely, that clay content in soil above 25% would not require remediation,[752] is based on a misplaced reading of the TULAS regulation which focuses on clay percentage found in each monitoring well as if they were isolated whereas Ecuadorian regulation seeks to protect groundwater throughout all the locations with potentially usable groundwater.[753] As Mr. MacDonald testified, clay content can vary significantly over short distances within the same location,[754] it would not be logical to restore groundwater only in locations with less than 25% clay as those areas would be re-contaminated by the contaminants in the un-remediated adjacent areas.[755]

659. Ecuador also defends Mr. MacDonald's using a laboratory analysis method which Perenco argues could misidentify as TPH naturally occurring substances such as waxy leaves.[756] First, Mr. MacDonald's testing method was the same as that used by GSI (which has made no prior complaint of the possibility that waxy organic matter could skew results). Second, Perenco's comparison between chromatograms of crude oil and dissolved phase organic constituents is not appropriate. Third, Mr. MacDonald's explanations about the detection of petroleum hydrocarbons in his groundwater samples have been consistent and are supported by substantial evidence.[757]

660. Ecuador's own criticisms about Mr. MacDonald's groundwater results are the following: Ecuador points out that the Expert was limited to "*confirm[ing] the presence or absence of contamination*." The scope of his work was not designed to delineate the full extent of the groundwater impairment in the sites. Hence, in order to determine the "*potential extent of groundwater contamination*", Mr. MacDonald used a predictive analytical tool. The exercise performed, however, underestimates the full extent of groundwater impacts.[758] In

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752 Ecuador's Closing Presentation, Slide 29; Tr. (2) (MacDonald) (12 March 2019) 402:16-19.

753 Tr. (2) (MacDonald) (12 March 2019) 403:20-404:3.

754 Tr. (2) (MacDonald) (12 March 2019) 402:20-22.

755 Tr. (2) (MacDonald) (12 March 2019) 403:7-15. See Ecuador's Closing Presentation, Slide 29.

756 Tr. (2) (MacDonald) (12 March 2019) 404:11-14.

757 Tr. (2) (MacDonald) (12 March 2019) 404:11-405:12.

758 Ecuador's Comments to the Independent Expert Report dated 22 February 2019, paragraph 46.

Payamino 13, for example, using the Groundwater Predictive Tool, Mr. MacDonald estimated that the identified groundwater contamination could only migrate 1.6m (and based the remediation costs on a plume dimension of only 1.6m). Yet, no identifiable potential source of contamination exists within 1.6m of the impacted monitoring wells, which confirms that the contamination had to migrate from a farther distance and the remediation costs calculated by MacDonald are underestimated. In short, groundwater contamination actually extends beyond the limited plume estimated by Mr. MacDonald.[759]

(d) Unit Costs

661. Ecuador considers that Mr. MacDonald's current quantification of remedial costs is the bare minimum. His estimate, which is in the conceptual phase, would be expected to be less accurate than that developed at subsequent design stages for a remediation plan. With the significant data gaps that remain to date, a contingency factor of 10% to 30% is insufficient.[760]

662. That said, Ecuador defends Mr. MacDonald's unit cost estimates as being consistent with local quotes.[761] While Perenco accuses Mr. MacDonald as only considering the US RACER database and asserting that he relied on US-based costs as exhibited in that system, Ecuador points out that Mr. MacDonald has repeatedly stated that he considered local costs and submitted evidence of that.[762] RACER was only a litmus test. This is confirmed once the Hidrogeocol quote is converted for a direct comparison with Mr. MacDonald's estimate – they are very similar.[763]

663. Ecuador further asserts that Perenco cannot argue that Mr. MacDonald's unit costs are too high on the basis of the Ecuambiente quote, Petroamazonas' December 2018 contract with Incinerox, or what was declared in Petroamazonas' bond offering in 2006. *First*, the

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759 Ecuador's Closing Presentation, Slide 27.

760 Ecuador's Comments to Section 6.3 of the Independent Expert Report, paragraphs 4 & 7.

761 Tr. (2) (MacDonald) (12 March 2019) 399:18-19.

762 Tr. (2) (MacDonald) (12 March 2019) 399:4-7.

763 Tr. (2) (MacDonald) (12 March 2019) 400:1-4.

Ecuambiente quote is too low. *Second*, the Petroamazonas' contract is not one for remediation. *Third*, the bond offering does not provide sufficient details to allow any reliable conclusions to be drawn from it.[764]

664. Perenco also criticised Mr. MacDonald for not having prepared a bid package to establish local costs. Ecuador points out that GSI also did not prepare a bid package and that did not prevent them from quantifying the alleged remediation costs– this was admitted by Mr. Bianchi during the Expert Hearing.[765]

665. Finally, Ecuador supported Mr. MacDonald's proposed remediation technology for groundwater, which was criticised by Perenco, as being an appropriate choice in the circumstances.[766]

2. Perenco's Observations on the Independent Expert's Findings

666. Perenco asserted that Mr. MacDonald's volume and cost estimates were exaggerated. Perenco argued further that the Independent Expert Report failed to address issues that the Tribunal had directed Mr. MacDonald to study.[767] For the issues that he did address, he relied on unjustified assumptions instead of on scientific and historical data, erred in his analyses, and disregarded Ecuadorian regulations and the Tribunal's own directions.[768]

667. Despite the Tribunal's instructions, Mr. MacDonald has not investigated the cause of the exceedances, or, where there could be several causes, how to allocate responsibility to Perenco or any other contributor. Thus, Mr. MacDonald's US$160 million remediation cost cannot be a figure for which Perenco alone should bear responsibility.[769]

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764 Tr. (2) (MacDonald) (12 March 2019) 487:19-492:16.

765 Tr. (2) (MacDonald) (12 March 2019) 399:12-17.

766 Tr. (2) (MacDonald) (12 March 2019) 405:21-406:4.

767 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 1.

768 *Id.*

769 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 2.

668. In its submissions on the Tribunal's Independent Expert Report, Perenco focused on what it identified as nine significant deficiencies that have material financial consequences.[770] In its closing submissions, Perenco grouped these issues into those relating to (1) soil volumes, (2) mud pits, (3) groundwater and (4) unit costs.[771] Correcting for these errors, Perenco submitted that the overall remediation cost is no more than US$65 million, of which only US$25 million can conceivably be allocated to Perenco.[772]

669. Perenco also observed that while Mr. MacDonald "*carried out work consistent with good standards in many respects*", he did not have experience in the *Oriente* region and was not a specialist in carrying out such projects in Ecuador.[773]

(a) Soil

(i) Land use classification

670. Perenco took issue with Mr. MacDonald's land use classifications which it asserted was based on "*visual inspection*"[774] and which is not adequate.

671. First, Mr. MacDonald's approach is contrary to the Tribunal's direction that land use classifications "*should be guided by the Ecuadorian authorities' practice in relation to the Blocks*" and that prior determinations by the Ecuadorian authorities have "*significant probative value*."[775]

672. Perenco asserted that Ecuadorian authorities have repeatedly accepted the application of "*agricultural*", not "*sensitive ecosystem*", criteria in areas surrounding platforms. IEMS conceded this. TULAS further provides that agricultural lands include those "*classified as*

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770 *Ibid.*, paragraph 3.

771 See Perenco's Closing Presentation, Slide 5.

772 The Tribunal sets out the Parties' arguments about causation and double recovery in a separate section III.F below.

773 See Perenco's Closing Presentation, Slide 6, referring to Tr. (1) (MacDonald) (11 March 2019) 171:9-13.

774 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 25 and fn. 49, referring to the Independent Expert Report, p. 25.

775 *Ibid.*, paragraph 26 and fns. 51-52.

agricultural" even if they contain "*native flora.*"[776] Despite Mr. MacDonald's assertions to the contrary, his visual inspection conclusions conflicted with those of the Ecuadorian authorities – two examples being Coca 6 and Mono CPF, where Ramboll chose 'sensitive ecosystem' even though Ecuador's own environmental impact studies acknowledged that areas surrounding the platforms had to be remediated to agricultural standards despite being surrounded by lush secondary forest.[777]

673. Second, Perenco argues that Mr. MacDonald's land use classifications reveal a lack of proper spatial and temporal observations. Mr. MacDonald appears to have taken the Tribunal's guideline to apply a more stringent classification in any case of doubt as an excuse to rely on superficial or perfunctory visual observation instead of conducting a thorough investigation into how landowners and residents actually use the land over time. This ignores the full scope of the Tribunal's directions that land use classifications "*should be reasonable in the circumstances of the particular case*."[778]

674. Perenco points to three examples which were misclassified as sensitive ecosystem: Coca 10-16, where an area just north of the platform that is within a stand of trees which is actually surrounded by cleared agricultural plantations and a Petroamazonas pit farm; Payamino 10, which is actually characterised by obvious agricultural activity, large swaths of cleared areas and a pit farm which appears to contain approximately 20 pits; and Gacela 04, which is a huge Petroamazonas pipeline right of way (even Ramboll recognises that "operating areas containing other in-use infrastructure" are industrial lands, not 'sensitive ecosystem')[779].

675. Third, Mr. MacDonald also improperly designated "*inactive*" sites as sensitive ecosystem. Perenco argued that the fact that a well is "inactive" indicates that it might be reactivated. The Tribunal held that sensitive ecosystem does not apply to a site that is "expected to be

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776 *Ibid.*, paragraph 26.

777 *Ibid.*, paragraph 27.

778 *Ibid.*, paragraph 29 and fn. 59.

779 *Ibid.*, paragraph 32 and fn. 62, referring to the Independent Expert Report, p. 38.

operated for many years to come . . . [and] still distant from any 'posterior use.'"[780] Yet, that is what Ramboll did for instance at Lobo 4 and Jaguar 7-8, which it called sensitive ecosystem simply because the platforms are currently "inactive."[781]

(ii) Background calculations

676. Perenco argued that Mr. MacDonald incorrectly excluded all of GSI's samples of clean soils to determine background concentrations while relying on IEMS' equivalent samples.[782]

677. First, Mr. MacDonald's exclusion of GSI's background samples because "many" were "collected in the *immediate vicinity* of certain platforms and proximate to areas investigated for oilfield related impacts" directly contravened TULAS, which specifies that samples should be taken in those areas immediately outside the area under study.[783] Proximity should have been a qualifying, not a disqualifying, feature of GSI's background samples. Even if proximity were a concern, this could not justify a blanket exclusion of all 91 GSI samples; Mr. MacDonald should also have applied the same threshold to IEMS' samples, some of which were even closer to the areas of study than GSI's samples were.[784] In any event, in the six sites that both IEMS and GSI sampled for background, 50% of IEMS's samples are closer to the platforms than GSI's samples – it cannot be that all of IEMS's background samples were uniformly valid whereas GSI's were not.[785]

678. Second, the fact that Mr. MacDonald adopted GSI's chromium background data derived from GSI's samples proves that the samples were not in fact "too close" to platforms. If they had been "too close," they could not have yielded valid chromium data either.[786]

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780 *Ibid.*, paragraph 34 and fn. 65, referring to the Interim Decision, paragraph 490 and Perenco's Annotations to Sections 3.1 and 6.2 of the Independent Expert Report.

781 *Ibid.*, paragraph 34 and fn. 66.

782 *Ibid.*, paragraph 23.

783 *Ibid.*, paragraph 36 and fn. 69.

784 *Ibid.*, paragraph 37.

785 *Ibid.*, paragraph 39.

786 *Ibid.*, paragraph 40.

679. Third, Ramboll's exclusion of GSI's background data because GSI "excluded a number of sample concentrations identified as high outliers from their data sets" also makes no sense. GSI's exclusion of what it considered to be high outlier samples made their background concentrations more conservative. Even if Ramboll considered this approach to be inappropriate, the proper response was to include the outlier samples, not exclude all non-outlier samples. Indeed, Ramboll itself included the GSI outlier samples to run its statistical test and also made exactly this kind of "correction" to the IEMS data, which it corrected to account for "typographical/compilation errors" and non-detect results.[787]

680. Fourth, Ramboll's disregard of GSI's background samples in the belief that they are drawn from a different statistical "population" than IEMS's background samples misapplies a statistical tool.[788] Perenco argues that what the data reflect is simply the fact that Block 7, comprising more than 200,000 hectares and different geological zones, actually has many subpopulations. Such exists even within IEMS' own samples.[789] Mr. MacDonald should not have rejected the GSI samples; even he acknowledged that more background samples are better.[790]

(iii)Delineation

681. Perenco asserted that Mr. MacDonald's delineations ignored the sites' topography, active equipment and site features, and its own clean soil samples. Thus, they were inconsistent with the reality of the sites and result in over-estimating contamination.[791]

682. First, Mr. MacDonald's "macro-delineation" approach ignored topography as well as active equipment and site features. For instance, Ramboll's delineation in Coca 6 included a ridge bordering a drainage swale and assumed that contamination west of the ridge could

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787 *Ibid.*, paragraph 41.

788 *Ibid.*, paragraph 42.

789 *Ibid.*, paragraph 45.

790 See Perenco's Closing Presentation, Slide 15.

791 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 47.

somehow have extended all the way up the slope and over onto the top of the ridge.[792] In Mono CPF, also shown below, Ramboll's defined remediation area included production facilities with a flare and API separator.[793]

683. Second, Mr. MacDonald's delineation included remediation of areas where Ramboll's samples showed no exceedances or where Ramboll did not even take samples. An example is Coca 02/CPF, where the delineated area included no detected exceedances at all and includes a right-of-way pipeline that Petroamazonas constructed after GSI's and IEMS's sampling campaigns.[794] Perenco also pointed out that Mr. MacDonald's delineation would require remediation of ballast, which is not soil (*e.g.* in Jaguar 03), remediation of waste disposal cells (*e.g.* Payamino Sanitary Landfill) or remediation of areas with no TPH exceedances (*e.g.* Yuralpa CPF).[795]

(b) Mud Pits

684. With respect to mud pits, Perenco argued that Ramboll ignored historical and visual evidence of synthetic liners and as a result applied the wrong regulatory criteria (*i.e.*, the more stringent exceedance requirements for unlined mud pits) and exceeded the Tribunal's mandate and the Parties' due process rights by sampling pits and that the Parties had not previously sampled.[796]

685. Perenco criticised Mr. MacDonald for assuming "without exception" that Perenco's pits were unlined, contrary to the Tribunal's instruction to further investigate whether those pits were closed with impermeable liners and to "ascertain whether the drilling muds were disposed of in a properly constructed sealed pit."[797]

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792 *Ibid.*, paragraph 48.

793 *Id.*

794 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 49.

795 *Ibid.*, paragraph 50; Perenco's Annotations to Section 6.2 of the Independent Expert Report.

796 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 23.

797 *Ibid.*, paragraph 52.

686. First, even though Mr. MacDonald claimed that drilling through the bottom of the mud pits to confirm the existence of liners would have compromised the units if the liners were present, Mr. MacDonald could have manually excavated a shallow portion around the edge of the pit and ascertained the presence or absence of an impermeable liner on the interior side slope of the excavation.[798]

687. Second, even when Ramboll observed visual evidence of liners at some mud pit perimeters, it ignored that evidence because "*it had no information regarding its condition or latent extent*" and "[p]hotographs taken by Perenco at the time of closure of *some* mud pits show that an excavator was typically used to treat the mud pit material in place, which likely would have resulted in the tearing or ripping of any liner material."[799] However, rather than treat mud pit material in place, the record shows that Perenco often mixed mud in auxiliary pits before transferring the muds to actual disposal pits, and the excavators were simply used to place mud pit materials inside the pits. This practice would not have *likely* resulted in the tearing or ripping of any liner material. Ramboll fails to consider this evidence at all.[800]

688. Third, Ramboll should have taken into account record evidence showing that a number of Perenco's pits have impermeable synthetic liners. Contrary to Ramboll's claim that it was "not provided any direct evidence as to whether liners are present for any specific mud pit," Perenco had submitted pit closure reports, photographs, and testimony demonstrating that mud pits were lined with impermeable liners.[801] Perenco points to examples such as Oso 9, Coca 19 and Jaguar 9. Accordingly, several pits would meet the regulatory criteria and would not require remediation.

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798 *Ibid.*, paragraph 53.

799 *Ibid.*, paragraph 54 and fns. 105-106, referring to the Independent Expert Report, p. 73 and p. 65, fn. 142.

800 *Ibid.*, paragraph 54.

801 *Ibid.*, paragraph 55.

689. Perenco also criticised Mr. Macdonald for investigating some pits that were outside of his mandate and assuming that other pits contained exceedances without having sampled them.[802]

690. First, the Tribunal instructed Mr. MacDonald to sample sites which regulatory exceedances had been identified by either or both of the Parties' experts. However, Mr. MacDonald sampled three pits in Oso 9B even though neither GSI nor IEMS went to this site. He also sampled four pits in Oso 9A, even though the only soil sample, which was collected by IEMS, showed no exceedances. Mr. MacDonald also sampled Yuralpa Sanitary Landfill Pit 2 and Yuralpa G Pit 2, even though GSI and IEMS detected no exceedances at these sites and did not gather any samples from these pits. Perenco argues that Ramboll exceeded its mandate as it had investigated Oso 9A, Oso 9B, Oso 9 Pits 2 and 4, Yuralpa Sanitary Landfill Pit and Yuralpa G Pit 2, which were not areas that had been previously investigated or sampled by IEMS or GSI.[803] This was contrary to the direction in the Interim Decision on Counterclaim and the mandate identified by Mr. MacDonald in his report[804] These were not areas that had been previously investigated or sampled by IEMS or GSI.[805]

691. Second, contrary to the Tribunal's instruction, Mr. MacDonald assumed that exceedances existed in two mud pits in Oso 9 simply on the basis that the adjacent pits did not conform to the leachate criteria for lined pits, without having taken any samples from those pits and despite acknowledging that mud pits 2 and 4 were "not investigated by either the Parties or *Ramboll*."[806] This assumption is proven erroneous by Ramboll's own sampling which found that Pit 8 in Oso 9 met the performance criteria even though the adjacent Pit 9 did

802 *Ibid.*, paragraph 56.

803 See Perenco's Closing Presentation, Slide 21.

804 Perenco's Closing Presentation, Slide 21, referring to the Interim Decision on Counterclaim, paragraph 603 & the Independent Expert Report, p. 49.

805 See Perenco's Closing Presentation, Slide 21.

806 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 59.

not. As a result, these nine Oso pits and two Yuralpa pits should be excluded since they are beyond the Tribunal's mandate and there is no evidence of exceedances.[807]

692. Further, Perenco argued, based on pit closure reports and other contemporaneous documents, that there were liners present in properly closed pits at 18 of the mud pits in five sites.[808] This implies that Perenco complied with RAOHE criteria at the time of closure. Perenco has also proven that the mud pits, or at least some segment of them, had intact liners at the time of installation and there is no legitimate specific evidence that there is any problem with those.[809] Perenco also argued that IEMS' field notes either recorded references to Coca 4 and Payamino concrete pits, which were not made by Perenco, or record employees as saying that the pits were lined and they had no reason to think there were any problems with them or that they were leaking.[810] As for the use of excavators, Perenco argued that it is common practice, which even Petroamazonas follows.

693. Third, Perenco argued that Mr. MacDonald's mud pit remediation also suffered from the following technical deficiencies: Ramboll's remediation of mud pit 1 at Yuralpa Pad A, where Ramboll disregarded RAOHE's performance criteria and the pit would require no remediation under the correct criteria (Perenco argued that Table 7b criteria applied)[811]; Ramboll's disregard of RAOHE's instructions to test leachates for 6 PAHs (and instead applied it to the sum of 16 PAHs)[812]; Ramboll's finding that clean soil cover on pits needs to be remediated even though it contains no exceedances;[813] and because Ramboll did not have "specific mud pit dimensions" for the particular pits it sampled in Oso 9A and 9B, it

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807 *Ibid.*, paragraph 59.

808 Tr. (2) (MacDonald) (12 March 2019) 427:1-5, referring to Perenco's Closing Presentation, Slide 16.

809 Tr. (2) (MacDonald) (12 March 2019) 427:15-20.

810 Tr. (2) (MacDonald) (12 March 2019) 429:8-13.

811 See Perenco's Annotations to Section 6.2 of Independent Expert Report, pp. 196-197 of the Consolidated Expert Report.

812 See Perenco's Annotations to Section 6.2 of Independent Expert Report, p. 195 of the Consolidated Expert Report.

813 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 60 and fn. 123; see also Perenco's Annotations to Section 5.2 of Independent Expert Report, p. 94 of the Consolidated Expert Report.

designated for remediation two entire pit farms comprising many pits, most of which Ramboll had not even sampled.[814]

(c) Groundwater

694. With regard to groundwater, Perenco argues that Mr. MacDonald disregarded express TULAS clay content criteria for groundwater samples and failed to recognise that its own lab data shows that purported TPH exceedances were due to natural organic matter, not crude oil.

695. First, Perenco argues that Ramboll disregards TULAS' clay content rules and that TULAS does not apply when clay content is above 25%. TULAS Book VI, Annex 1, Table 5 provides that the "reference quality criteria for groundwater" to which it applies are "soil with clay content between (0-25.0%)." TULAS therefore does not provide specific criteria for aquifers with higher clay and/or organic matter content; this means that soils with a clay content higher than 25% (and an organic matter content of less than 10%) do not need to comply with the TULAS Table 5 criteria and, accordingly, that exceedances of those criteria do not constitute environmental harm if the soil has a clay content above 25%. This was not disputed by IEMS.[815]

696. In this regard, Perenco further relies on Mr. Bianchi's explanation given at the Expert Hearing that the clay content rules are applied straightforwardly in Ecuador.[816] Mr. MacDonald's disapproval of the regulatory line drawn in Table 5 is not a valid basis for the Tribunal to deny it and, Perenco argues, the Ecuadorian regulators' decision to only require low barium content in water with less than 25% clay is rational because people do not drink water that has lots of clay or lots of organic material floating in it.[817] It is a compromise as part of the balanced development and balanced environmental approach

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814 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 58.

815 *Ibid.*, paragraph 62 and fn. 128.

816 See Perenco's Closing Presentation, Slides 24, referring to Tr. (1) (MacDonald) (11 March 2019) 268:17-269:12.

817 Tr. (2) (MacDonald) (12 March 2019) 434:1-15.

that Ecuador wants to take. In any event, IEMS' first report and other evidence show that groundwater is actually not the source of drinking water in this area and which may be another reason why this regulation made sense in the way that it was phrased.[818]

697. Once groundwater samples with clay content over 25% are excluded, many of Ramboll's monitoring wells show no exceedances.

698. Second, Perenco observes that Mr. MacDonald's groundwater results returned almost ubiquitous TPH "*hits*", even in areas where no TPH exceedances were identified in the surrounding soil, and even in areas where neither IEMS nor GSI had ever encountered TPH in their groundwater sampling. As Mr. MacDonald appeared to acknowledge, these unexplained TPH exceedances are unusual and should have raised a red flag. In fact, the type of test that Ramboll's lab ran uses a method that is not specific to petroleum from crude oil and can misidentify as TPH naturally-occurring substances like waxy leaves. Ramboll's failure to investigate this difference is especially problematic since waxy leaves are common in the Ecuadorian jungle. Had Ramboll examined chromatograms for its samples to determine whether they are really oilfield impacts or natural phenomena, it would have seen that most of them are not crude oil at all.[819]

699. Perenco also criticises Mr. MacDonald's modelling tool for groundwater.[820] In the swampy terrain and generally low-permeability soils of Blocks 7 and 21, groundwater moves very slowly and cannot transport contaminants over significant distances, even over long time periods. The modeling tool used by Ramboll and the sensitivity analysis conducted should, by design, provide a conservative overestimate of the true plume dimensions. However, Ramboll reached a surprisingly high remediation cost of $25 million for groundwater. This incongruous result should, again, have prompted further analysis of Ramboll's results. Perenco points out three issues with Mr. MacDonald's groundwater modelling: (i) he used the three-dimensional version of the modelling software, instead of two-dimensional, it

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818 Tr. (2) (MacDonald) (12 March 2019) 434:16-20.

819 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 64.

820 Perenco's Annotations to Section 6.1 of the Independent Expert Report, p. 145 of the Consolidated Expert Report.

would have predicted far smaller plumes at each site; (ii) his model does not account for biodegradation of contamination over time and thus overestimates the size of the groundwater plume; (iii) for a number of plumes reported by Ramboll, no source of the plume could be identified, which is consistent with other factors that suggest that these plumes are not present and are an artifact of faulty TPH results in some cases.

(d) Unit Costs

700. Perenco asserts that Ramboll's unit costs for remediation do not reflect local costs. Ramboll failed to consider actual costs spent by Petroamazonas itself for comparable remediation work, even though the Tribunal had stated that such costs are the "best guide for estimating comparable remediation works."[821] Ramboll's costs are inflated. Ramboll has failed, contrary to the Tribunal's directions in the Interim Decision on Counterclaim that quantification must be based on actual Ecuadorian costs.[822] Perenco also complains that Ramboll never provided a copy of its quote for groundwater and soil for the Parties' verification.[823]

701. Moreover, for soil in particular, Ramboll's unit costs bear no relationship to actual costs in Ecuador, as shown in the two quotes that Ramboll belatedly obtained as well as in Petroamazonas' own public documents. Instead, Ramboll generated its soil remediation numbers through RACER, which provides estimates based on remediation costs in the United States.[824] This is in stark contradiction to the costs of Petroamazonas that they have in an actual contract, which were achieved through an appropriate method.

702. First, Ramboll did not analyse evidence of local costs already in the record of this proceeding or explain its basis for rejecting them. As GSI had explained, numerous remediation projects have been completed at oilfield facilities in the *Oriente* region pursuant to the requirements of RAOHE and/or TULAS and subject to review and approval

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821 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 65 and fn. 137.

822 Perenco's Closing Presentation, Slide 44; referring to Interim Decision on Counterclaim, paragraph 579 and fn. 1156.

823 Perenco's Comments to the Independent Expert Report, paragraph 66.

824 Perenco's Closing Presentation, Slide 48 referring to Mr. MacDonald's testimony at Tr. (1) (MacDonald) (11 March 2019) 87:21-88:5.

by the Ecuadorian authorities, including projects by Petroecuador and other oilfield operators. At $410/m.[3] Ramboll's gross unit rate for soil remediation substantially exceeds all of these government-approved remediation projects. Whereas the Tribunal acknowledged that GSI's conservative bulk cost estimate for soil remediation of $260/m³ was "much closer" than IEMS's to actual remediation costs in Ecuador, Ramboll's figure is inexplicably more than twice as high.

703. Second, Ramboll has ignored actual remediation costs incurred by Petroamazonas, which are readily available in public documents. In December 2018, Petroamazonas signed a contract for remediation works in Blocks 7 and 21, among others, that includes significantly lower unit costs for soil remediation: for instance, $39/m³ for treatment and disposal of soil with TPH and metals, compared to Ramboll's $160/m³. Similarly, in December 2017, Petroamazonas issued a bond offering, according to which "[i]n 2016, Petroamazonas incurred expenses of approximately $23.1 million for the implementation of Project Amazonia Viva," which included the remediation of "approximately 364,240 cubic meters of soil[] and 191 sources of pollution" in certain blocks outside Blocks 7 and 21. These figures imply a bulk unit cost of around $63/m³, while Ramboll's corresponding bulk unit cost of $410/m^3 is six times higher. The magnitude of these discrepancies between actual, recent, documented costs for work in the Blocks and surrounding areas, on the one hand, and Ramboll's software-generated black box estimate based on remediation in the United States, on the other, are indicative of the unreliability of Ramboll's overall approach and the caution with which the Tribunal should treat it.[825]

704. Third, Ramboll's quotes from two local contractors, Hidrogeocol Ecuador and Ecuambiente, are also not a reliable guide. Ramboll appears to have received the quotes in late November and December 2018 —an entire year after it concluded the second sampling campaign in Ecuador, and barely three weeks before Mr. MacDonald submitted the Report to the Parties. Hidrogeocol's unit cost for transportation and treatment of soil contaminated with TPH and heavy metals amounts to $260/m³, six times higher than Petroamazonas's actual unit cost of $39/m³ for comparable remediation work. Similarly, Ecuambiente's unit

825 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 69.

cost for transportation and treatment of soils with just TPH is $56/m³ while Petroamazonas's actual unit cost is $46/m³ for comparable remediation work. Ramboll does not appear to have obtained a range of quotes from other contractors or to have taken account of the fact that quotes initially provided to foreign companies —especially in a litigation context— are typically higher.[826]

705. Finally, despite having obtained these inflated quotes, no doubt because they were received so late, Ramboll did not even apply them in calculating its remediation costs. Instead, Ramboll increased certain kinds of unit costs based on no apparent reason other than its unexplained "*professional experience*." In circumstances where the Tribunal has held that "*the expert shall be guided by Ecuadorian costs*", that is not an acceptable approach.[827]

706. Ramboll's remediation unit costs thus do not establish the actual local costs on which remediation must be based, as the Tribunal determined. Instead, the Tribunal should apply the actual costs recently incurred by Petroamazonas itself, which provide the "best guide for estimating comparable remediation works." Adjusting Ramboll's estimated unit costs to reflect Petroamazonas's actual costs for soil reduces Ramboll's soil unit costs by half. Thus, Ramboll's soil remediation cost falls from $98 million to $50 million simply by using local costs, and to approximately $40 million after all technical corrections (before allocation).[828]

F. Causation and Double Recovery

707. While Mr. MacDonald was not instructed to investigate causation, in addition to their comments and submissions with respect to Mr. MacDonald's investigations and findings, the Parties addressed this as well as the issue of double recovery in light of the *Burlington* tribunal's decision on Ecuador's environmental counterclaim. The Parties' arguments are set out below.

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826 *Ibid.*, paragraph 70.

827 *Ibid.*, paragraph 71.

828 *Ibid.*, paragraph 72.

1. Ecuador's arguments

708. Ecuador submits that the Tribunal's Interim Decision on Counterclaim is clear that the burden of proof is on Perenco.[829] Therefore, if there is a regulatory exceedance, Perenco is responsible unless it can prove that some other person or an external event caused harm. Perenco has failed to discharge this burden of proof and therefore should be liable, at the very least, for the contamination confirmed by Mr. MacDonald in Blocks 7 and 21.[830]

709. First, insofar as alleged contamination caused by operators *prior* to its assuming operations in Blocks 7 and 21, Perenco has failed to prove that the extensive contamination confirmed by Mr. MacDonald was already present in the Blocks when it assumed operations in 2002.[831]

710. Perenco failed to point to documentary evidence confirming its theory that contamination would have been caused by prior operators: (i) Perenco failed to conduct a comprehensive written study of the environmental condition of the Blocks at the time of acquisition; (ii) neither the PSA entered into Perenco and Kerr-McGee nor Perenco's 2002 Biennial Audit suggested major environmental problems at the time; and (iii) even Perenco's 2006 and 2008 superficial and highly selective biennial audits showed a steep decline of the environmental conditions of the Blocks.[832]

711. Perenco cannot attribute the contamination to prior operators (which were limited to 23 sites only). Ecuador's responses to Perenco's allegations for five of these sites are as follows: (i) evidence on record shows that the contamination in Payamino 2-8 dates from the time of Perenco's operations; (ii) the exceedance in the swampy area southeast of Coca CPF was associated with discharge of produced water with oil residue from the API separator during Perenco's operations, as confirmed by Mr. MacDonald and acknowledged by Mr. Salto before the *Burlington* tribunal; (iii) 1999 spill in Coca 6 migrated to the

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829 Ecuador's Closing Presentation, Slide 5.

830 Ecuador's Comments to the Independent Expert Report dated 22 February 2019, Section 3.

831 *Ibid.*, paragraph 50.

832 *Ibid.*, paragraphs 50-53.

southwest of the platform, whilst the area to be remediated identified by Mr. MacDonald is located to the southeast of the platform; (iv) the *Burlington* tribunal held Perenco responsible for the remediation of the Coca 8 pit; and (v) GSI inspected the pit in Payamino 4 and attested that there was no leakage – therefore, any contamination could not be related to this pit.[833]

712. With respect to Perenco's denial of liability for 19 sites based on a "simplistic argument" that the exceedances in these sites mostly related to heavy metals and pit areas and therefore were caused by drilling pre-dating its operatorship, Ecuador argues that this assumption is unsupported.[834] For example, Perenco argues that barium exceedances could only arise from original drilling activities. However, Perenco conducted numerous workovers and its admitted practice of transporting drilling muds from one site to another for storage, both of which are likely to have caused the exceedances found.[835] In Yuralpa A, Perenco itself also drilled in the period 2003-2006 and should know whether its drilling caused contamination on this site.[836] There were also numerous unreported oil spills during Perenco's operations and there is no evidence that these were properly remediated.[837] Perenco now accepts that at least part of the contamination in Jaguar 1 was caused by an unreported spill during the time of its operations and it drilled in Coca 19 in 2003, where Mr. MacDonald confirmed soil contamination and non-conforming Perenco-associated pits.[838]

713. Moreover, if Perenco really wanted to identify the cause and timing of the TPH exceedances found, it could have conducted (as it had an ample opportunity to do pre- and post-July 2009) a hydrocarbon fingerprinting analysis or other laboratory forensic

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833 *Ibid.*, paragraph 55.
834 *Ibid.*, paragraph 56.
835 *Id.*
836 *Id.*
837 *Ibid.*, paragraph 57.
838 *Ibid.*, paragraph 58.

technique. At the least, the tests would be able to show whether a particular release was fresh or very dated such that it would be pre- or post-Perenco operations.[839]

714. Further, Perenco inherited all environmental liability for any pre-existing conditions present in the Blocks.[840]

715. Ecuador submits further that Perenco-associated pits were found to be non-compliant at all of the sites investigated by MacDonald.[841] This finding is unsurprising and confirms that Perenco's poor practices extend to its location, construction, use and management of pits. There can, thus, be no doubt, that these exceedances are attributable to Perenco. Ecuador further argues that Perenco is liable, at the very least, for the complete remediation of all the mud pits investigated by Mr. MacDonald because: (i) Perenco has the burden of proof regarding the placement of proper pits as it would have such records, but has failed to discharge it;[842] and (ii) there were many more mud pits that Mr. MacDonald should have, but did not, investigate.[843]

716. Second, with respect to alleged contamination caused by Petroamazonas ("PAM") after it assumed operations in Blocks 7 and 21, Perenco is not able to prove that any contamination identified by Mr. MacDonald is attributable to Petroamazonas. Perenco has referred to only one incident at Mono CPF in 2011 that that would allegedly be the source of the contamination in one of the areas in that site. However, the limited contents of that 2011 spill make their way to the opposite end of the platform due to the terrain gradient (*i.e.*, the northeast and not the southeast of the platform, where the contaminated area confirmed by Mr. MacDonald is located), but it is also chronologically impossible for the contamination delineated by the Expert to result from a 2011 PAM spill, given that, already during their first field campaign in October 2010, IEMS had collected samples showing TPH

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839 *Ibid.*, paragraph 60.

840 Ecuador's Closing Presentation, Slide 10.

841 Ecuador's Comments to the Independent Expert Report dated 22 February 2019, paragraph 61.

842 Ecuador's Closing Presentation, Slide 18.

843 *Ibid.*, Slide 19.

exceedances in the same area as Mr. MacDonald.[844] Other than this isolated incident, Perenco's only other claim is that Petroamazonas' new works overtook areas at 9 other sites.[845]

717. In any event, the evidence on record, including the documents recently disclosed by Ecuador, confirms that Petroamazonas neither caused nor contributed to the contamination. *First*, 11 of the sites and all the pits identified for remediation have not been operated or used by Petroamazonas.[846] *Second*, as Mr. MacDonald performed a gap filling exercise, the contamination he found is the same identified by IEMS (and others, like Walsh and GSI) since 2010. *Third*, none of those who conducted inspections from 2010 to 2017 observed any environmental incidents after July 2009 and Mr. MacDonald's report does not mention any signs of recent contamination observed during Ramboll's investigations.[847] *Fourth*, documents recently produced by Ecuador confirm that there were no incidents reported during Petroamazonas' operations in 30 sites identified for remediation. For those sites where an incident occurred, those incidents could not be the cause of the harm as they occurred at different locations from Mr. MacDonald's remediation locations and were, in any event, promptly remediated by Petroamazonas.[848]

718. In response to the Tribunal's invitation for comments regarding a possible general discounting factor to account for Petroamazonas' possible contribution to the environmental harm,[849] Ecuador makes the following two submissions.

719. First, as set out above, Petroamazonas has neither caused nor contributed to the harm identified by Mr. MacDonald, and save for two areas in Coca CPF and Coca 1, none of the areas identified for remediation were overtaken by Petroamazonas' new works.[850]

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844 Ecuador's Comments to the Independent Expert Report dated 22 February 2019, paragraph 64.

845 *Ibid.*, paragraph 63.

846 *Ibid.*, paragraphs 66 and 68.

847 *Ibid.*, paragraph 70.

848 *Ibid.*, paragraph 71.

849 Procedural Order No. 17.

850 Ecuador's Comments to the Independent Expert Report, paragraph 74.

Perenco's complaint that Ecuador has failed to disclose some of Petroamazonas' spills relates to spills either introduced by Ecuador into the record, outside the scope of the Tribunal's order for document production or were addressed in Ecuador's letter of 11 March 2019 and now also part of the record.[851]

720. Second, careful consideration should be given to how the Tribunal determines a discounting factor if nonetheless the Tribunal were still minded to grant it. Ecuador anticipates difficulties and perverse incentives if the Tribunal were to allocate responsibility for groundwater based on the amount of time that each operator ran the Blocks because: (i) this rewards an operator who concealed the existence of contamination for years and tactically seeks to deny liability such that it would be able to share responsibility with the next operator;[852] (ii) a linear time-based rule would unfairly impose exclusively on Ecuador the burden of the time taken by Mr. MacDonald for completing his report; and (iii) this assumes the same amount of contamination is generated every year regardless of each operator's practices, but the Tribunal cannot assume that Petroamazonas operates under the same low standards employed by Perenco.[853]

721. Finally, Ecuador confirms that it is not seeking double recovery for the environmental harm in the Blocks. It submits that Mr. MacDonald has not found the "same harm" as the *Burlington* tribunal and Perenco, therefore, remains liable for the additional and/or different remedial areas, volumes and costs. In its submissions, Ecuador provided a site-by-site comparison of areas, depth, volumes and costs to identify overlaps adopting a conservative approach. Its accompanying explanations specific to soil, mud pits and groundwater are as follows.

722. **Soil**: no overlap can exist in relation to (i) sites for which the *Burlington* tribunal did not award any remedial costs; (ii) sites where Mr. MacDonald delineated different areas; (iii) sites or areas where Mr. MacDonald's sampling has confirmed contamination extends beyond or deeper than the *Burlington* tribunal's findings; (iv) sites or areas where the

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851 Ecuador's Closing Presentation, Slide 47-48, Tr. (2) (MacDonald) (12 March 2019) 412:5-18.

852 Ecuador's Comments to the Independent Expert Report, paragraph 76.

853 *Ibid.*, paragraph 78.

horizontal and vertical extent of the contamination estimated by Mr. MacDonald and the *Burlington* tribunal are similar, but for which Mr. MacDonald estimates higher remediation costs.

723. **Mud pits**: the *Burlington* tribunal awarded only US$11,106,050 for the remediation of mud pits at five sites (two of which were not considered by the Expert). Conversely, Mr. MacDonald concluded that (i) additional mud pits warrant remediation, and (ii) higher remediation costs – with respect to those awarded by the *Burlington* tribunal – would be required for remediating mud pits at Cóndor Norte (US$2,484,000 by Mr. MacDonald v. US$1,070,000 in *Burlington*) and the Payamino WTS (US$2,978,000 by Mr. MacDonald v. 2,025,000 in *Burlington*). Hence, Perenco is liable for the higher remediation costs at Cóndor Norte and Payamino WTS (*i.e.*, US$2,367,000) as well as the full remediation costs estimated for non-compliant mud pits at 11 sites.

724. **Groundwater**: the *Burlington* tribunal awarded only US$5,040,000 for groundwater remediation at Coca CPF, Payamino 14/20/24 and Payamino 15 (*i.e.*, US$1,680,000 per site). Conversely, Mr. MacDonald concluded that nine additional sites require groundwater remediation and estimated higher costs for the remediation of Coca 2/CPF (US$3,001,000 by Mr. MacDonald v. US$1,680,000 in *Burlington*). Perenco is, therefore, liable for the difference in groundwater remediation costs for Coca 2/CPF (US$1,321,000) as well as the full remediation costs estimated by Mr. MacDonald for the nine additional sites.

725. Finally, as it pertains to the well abandonment costs claimed by Ecuador for the seven sites in Perenco's November 2008 Well Site Abandonment Plan that it never carried out (and that PAM has never operated), Ecuador is entitled to any abandonment costs in addition to the US$929,722 granted by the *Burlington* tribunal.

726. Based on Ecuador's calculations, therefore, it is entitled to recover US$130,801,100 from Perenco.[854]

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854 *Ibid.*, Appendix A.

	POTENTIAL MAXIMUM REMEDIATION COSTS SUBJECT TO DOUBLE RECOVERY	POTENTIAL REMEDIATION COSTS NOT SUBJECT TO DOUBLE RECOVERY
Soil - Block 7	-15 714 000 USD	80 759 000 USD
Soil - Block 21	-495 900 USD	1 454 100 USD
Mud pits	-8 412 000 USD	28 304 000 USD
Groundwater	-4 457 000 USD	20 284 000 USD
TOTALS	**-29 078 900 USD**	**130 801 100 USD**

2. Perenco's arguments

727. In sum, Perenco argues that it cannot be liable at all for harm it did not cause; it cannot be solely liable for harm to which others contributed; and it certainly cannot be presumed to be liable for any conditions observed in the Blocks only years after its departure.[855] The fact that sampling found exceedances in Blocks 7 and 21 many years after Perenco's investment there was expropriated is not proof that Perenco caused those exceedances, and without proof of causation, there simply is no liability.

728. Perenco argues that the Tribunal decided in its Interim Decision on Counterclaim that the "onus of proof is on a party who makes an allegation" and that it is Ecuador who must disprove that Petroamazonas caused exceedances.[856] Ecuador's failure to do so cannot be remedied by presuming causation.[857] Perenco can only be *prima facie* liable for exceedances identified during Perenco's operatorship and can relieve itself of liability by demonstrating that someone else caused the harm. This must mean that Petroamazonas as

855 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 14.

856 Perenco's Closing Presentation, Slide 59.

857 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 8.

the current operator is strictly liable for harm save insofar as it can demonstrate that, in this case, Perenco, caused the harm.

729. There is no more reason to presume that Perenco, as one of several past operators, is liable for conditions identified years after it was ousted than to presume that any other prior operator is liable for them.[858] It would be unjust to do so when Petroamazonas has extensively developed the Blocks, turned forests into pit farms, dug up soils designated for remediation to make rights-of-way for new pipelines, and experienced dozens of spills that were only recently disclosed and even more which were not.[859] There are also no inequities on the facts of the case that justifies the shifting of the burden of proof to Perenco.

730. According to Perenco, the adjustment of Ramboll's remediation costs for causation would reduce those costs by almost a third.

731. First, most of the identified exceedances were caused by prior operators: (i) exceedances identified by Ramboll are largely associated with barium which in turn is associated with drilling that occurred prior to Perenco's operatorship – Perenco did not drill wells in many of the sites where soil exceedances were detected, including seven of the eight "inactive" sites that the Tribunal had identified; (ii) at least some of the TPH exceedances also stem from Ecuador's or other operators' tenure, *e.g.* Payamino 2-8, where a major environmental incident occurred during CEPE's operatorship, or Coca 6, where major spills occurred in 1999 and later in 2011; (iii) that is likewise the case for groundwater at sites where Ramboll identified barium exceedances, which can only be causally related to production well drilling, but where Perenco did not drill wells; and incidents that may have led to TPH contamination did not occur during Perenco's operations, *e.g.* Payamino 4-14, where Perenco did not drill wells and no TPH were identified in the 2011-2013 sampling campaigns.[860]

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858 *Ibid.*, paragraph 11.

859 *Ibid.*, paragraph 12.

860 *Ibid.*, paragraph 17.

732. Second, for the sites where Perenco may have contributed to the exceedances, there will inevitably be difficulties in allocating liability between Perenco and Ecuador. Perenco submits that the application of a discounting factor based on length of operatorship may be appropriate for both soil and groundwater. Such a discounting factor must, however, take into account the full history of operations at the given site, and cannot begin simply in 2002. The effluxion of time alone means that, for example, for groundwater, more than 70% of the remediation costs must be allocated to Ecuador.[861]

733. Third, for mud pit remediation, the Tribunal recognised that Perenco's liability is limited to the contents of the mud pits that Perenco built and used. Perenco cannot be held solely liable, however, for pit cover material (which Ramboll has treated as ordinary soil) that shows near-surface exceedances unrelated to Perenco's drilling of the associated wells.[862] Perenco further notes that there were mud pits which were already closed by the time of Perenco's operations.[863]

734. Perenco submits that it is not surprising that Perenco contributed to only a fraction of the issues identified in the Blocks. Environmental standards and practices were different in the 1980s and 1990s than they were during Perenco's operatorship.[864] Perenco's involvement in the Blocks was comparatively limited, both in time and in nature. Perenco's tenure lasted less than seven years compared to the 49 years that Block 7 and the Coca-Payamino Unified Field have been in operation and 47 years for some areas in Block 21. Petroamazonas has since developed the Blocks far more aggressively and has more than doubled the impact that Perenco could have.[865]

735. Perenco proposes that the following principles of allocation be adopted:

(a) **Pits**: 100% attributed to Perenco;

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861 *Ibid.*, paragraph 18.

862 *Ibid.*, paragraph 19.

863 See Perenco's Closing Presentation, Slides 22.

864 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 20.

865 *Id.*

(b) **Groundwater**: allocation by ratio of time;

(c) **Soil**: in summary, according to the type of soil exceedance, which might be categorized as follows: (i) barium only or barium with other metals (but no TPH); (ii) barium with TPH only (no other metals); (iii) barium, TPH and other metals; (iv) TPH only (no barium, no other metals) or other metals only (no barium, no TPH).[866]

736. The application of these principles would result in remedial costs of US$25,600,465:[867]

	Ramboll Estimate	With Causation Adjustment	With Technical and Causation Adjustments
Soil	$98,423,000	$23,310,662	$10,468,602
Pits	$36,715,000	$36,607,370	$14,865,533
Groundwater	$24,742,000	$5,835,619	$266,330
Total	**$159,880,000**	**$65,753,651**	**$25,600,465**

737. Perenco submits that this is reasonable and likely high. Its proposed methodology: (i) adjusts soil volumes at only 16 of Ramboll's 49 sites; (ii) allocates to Perenco 60% of the cost for Payamino 2-8; (iii) allocates to Perenco full responsibility for barium exceedances at sites Perenco drilled, even though Petroamazonas may have done workovers there; (iv) allocates to Perenco full responsibility for mud pits it built or used, even though approved pit closure reports show there was no fault, and even though Petroamazonas may also have used them; (v) allocates to Perenco its share of responsibility for metals-only exceedances, even if there is no barium or TPH to link them to oil operations; and (v) includes a cost

866 Perenco's Table 1 Soil Cost Allocation Methodology, Annotated Report, p. 13.

867 See Perenco's Closing Presentation, Slide 94.

contingency of up to 30%, despite Ramboll having filled gaps with another thousand samples.[868]

738. Perenco submits that this figure of US$25 million should be further adjusted in light of the Consortium's US$42 million settlement payment. This payment must be deducted from the total remediation cost to avoid double recovery. This would lead to an award of zero damages if all adjustments are applied.[869]

739. Even if the corrected unit costs allocated to Perenco were to exceed US$42 million, the Tribunal should order that Ecuador cannot simply offset any such residual remediation cost from the damages it owes to Perenco, but that it must deposit that amount, along with its share of the overall remediation costs, in a remediation fund that Ecuador must use solely for the purpose of remediating the Blocks.[870] This is the only way to ensure that the Tribunal's objective of protecting the environment is truly achieved, that Ecuador fulfills its promises to use the funds to remediate, and that the entire counterclaims process is not subverted for Ecuador's opportunistic monetary gain, it should not reduce Perenco's damages but be paid into a remediation fund.[871]

G. The Tribunal's Analysis

1. The Tribunal's view of the Expert's work

740. As can be seen from the summary of the Parties' submissions, many issues were raised by one Party or the other which bear upon the quantification of damages. The Tribunal considers that these ranged from the important to the irrelevant.[872] To the extent that the

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868 Perenco's Closing Presentation, Slide 95.

869 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 73.

870 *Ibid.*, paragraph 75.

871 *Id.*

872 As an example of the latter, the Tribunal saw no value in Perenco's attempt to diminish the Expert's work by reason of his lack of prior experience in Ecuador. It was the Parties themselves who identified, interviewed, and proposed Mr. MacDonald to the Tribunal. Both Parties were aware of his experience, which is extensive, and includes work in other Latin American countries. The fact that he had not previously worked in Ecuador is of no import or relevance.

Tribunal does not expressly deal with an issue raised by a Party, that does not mean that it has not been considered.

741. To begin, the Tribunal addresses the overall quality and reliability of the Report. The Tribunal is satisfied that Mr. MacDonald and his team from Ramboll acted impartially and independently and with a high level of technical proficiency. Mr. MacDonald began his work by performing an intensive data review exercise in order to familiarise himself with the work previously done by the Parties' experts and with the Tribunal's findings in the Interim Decision on Counterclaim.[873] During his testimony at the Expert Hearing, he indicated that he also consulted local advisors and counsel in Ecuador in an effort to fully inform himself of the regulatory regime so as to be able to discharge his mandate. [874] When it came to estimating remediation costs, Mr. MacDonald engaged a local consultant, Hidrogeocol Ecuador, to assist in obtaining quotations for remedial work.[875]

742. Although the Tribunal addressed the principal issues of Ecuadorian environmental law in the Interim Decision on Counterclaim, certain secondary issues remained to be addressed by the Expert in discharging his mandate. The Tribunal considers that he made reasonable decisions within the framework of Ecuadorian environmental law and administrative practice.

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873 Consolidated Expert Report, p. 2: "My findings and opinions are based upon documents provided by the Tribunal and the Parties, as listed in Section 8.0, supplemented by my visits to representative sites in Blocks 7 and 21 during October/November 2016 and again during fieldwork performed in the fall of 2017. I also relied upon various regulatory documents, standards, and scholarly and technical publications that are applicable to this matter. Finally, under my direction, Ramboll generated independent data and performed the relevant technical analyses to close significant data gaps in the investigation of soils and generated a technically valid data set to replace prior groundwater data gathered by the Parties. Under my direction, Ramboll also conducted work needed to document the compliance status of mud pits previously used by Perenco with applicable Ecuadorian regulations."

874 Tr. (1) (MacDonald) (11 March 2019) 269:15-19: "…I was not precluded from reading the regulations, interpreting them, nor of having conversations with other consultants in Ecuador, including environmental counsel where I was pushing and probing."

875 Tr. (1) (MacDonald) (11 March 2019) 85:19-21.

743. Mr. MacDonald and Ramboll conducted the sampling exercise transparently and considered suggestions made by the Parties' experts and representatives.[876] The Consolidated Independent Expert Report noted in this regard:

> "It is important to note that the Parties have had the opportunity to pose questions and comment on my work throughout this engagement, including before and during the performance of the field campaign. In addition, representatives of the Parties were present during all onsite activities, including the initial exploratory visit to the Blocks as well as during the performance of sample mark-outs and collection of samples from all investigated media. The field program was implemented over a four-month period and issues raised by the Parties during that time were always considered; in certain cases, my approach was adjusted to incorporate expanded information or to address concerns (when these were reasonable and technically valid). It was not always possible to reach full agreement with both Parties, as their commitments to their clients and strategic approaches differed from my own. However, in all cases, a respectful dialogue was established with both Parties, and to my knowledge neither expressed concerns regarding bias for or against either Party in this matter. Relevant correspondence, emails, and other documentation of this dialogue between the Parties and myself or field personnel is included in Appendix B."[877]

744. Mr. MacDonald acknowledged that he did not accept every suggestion from a Party, but that is hardly surprising, given how far apart the Parties' experts were in their own approaches and findings.[878] Moreover, again unsurprisingly, in a few instances, due to technical considerations, he chose not to precisely replicate a location at a site where one

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876 Mr. MacDonald noted that: "there was significant communications with the Parties, both legal counsel, as well as their Experts, in advance of the site work. There were frequent briefings with the Parties during the site work, all right, routine written and verbal communications responding to questions and careful consideration of all matters raised by the Parties, with adjustments made where we thought reasonable and appropriate." Tr. (1) (MacDonald) (11 March 2019) 21:21-22:7. See also his Direct Presentation, Slide 4, where he adverted to communications with the Parties before the site work was conducted, frequent briefings with the Parties during the site work, routine written and verbal communications to respond to questions or concerns raised by the Parties, and consideration of all matters raised by the Parties, with adjustments made where reasonable.

877 Consolidated Expert Report, Section 1.3.

878 *Ibid.*, p. 1: "The underlying technical investigations performed by each Party were based on differing conceptual frameworks, with Ecuador taking a more traditional due diligence approach with Phase II site investigation activities, while Perenco performed follow-up confirmatory, delineation and/or risk assessment studies. Further, in several cases, the Parties interpreted applicable regulations in different ways, conducted their fieldwork and data analysis using inconsistent protocols, and where similar remedial approaches were considered, developed dissimilar cleanup costs. Together, the investigations and evaluations did not provide the Tribunal with an adequate or consistent set of facts that could be used in their deliberations."

or the other of the Parties' experts had taken a particular sample; this was the case in relation to two groundwater monitoring wells (at PAY01-MW03 and PAY04-MW03).[879]

745. The Parties were, as already noted, given an opportunity to make written submissions and insert comments into the Independent Expert Report. They were also given the opportunity to cross-examine Mr. MacDonald on both days of the two-day Expert Hearing. Mr. MacDonald was a careful, credible, knowledgeable and objective expert witness.

746. The Tribunal notes further that the Parties collected "split groundwater samples."[880] The Parties were thus free to employ their own laboratory analyses to check the Expert's results. Although both Parties have criticisms of the Report (Perenco being more critical of his work than Ecuador), with one significant exception,[881] neither Party challenged the results of the laboratory testing.[882] The Tribunal therefore considers that the handling of the

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879 See Consolidated Expert Report, p. 68 – at two sites, the parties had not installed wells at locations- previous placement was not appropriate and adjusted the locations, *i.e.* Pay01-MW03 in REC 66 and JAG02-MW03. See also the letter of 28 December 2017 which states that 65% of groundwater wells were proposed in the immediate vicinity of wells previously installed by one or both Parties. Are located next to wells – 22/34 of the proposed wells. For 12 of 34 locations at nine sites, 5 were placed within site areas that were previously subjected to groundwater testing, but not at the exact locations of prior wells: 4 were located in areas with significant data gaps; 3 were placed near prior wells that had been previously installed within mud pits and to correct for contamination.

880 The only qualification to this statement concerns the taking of groundwater samples where it was necessary due to the low flow rate for the splitting of the samples to be done sequentially. Thus, by agreement of the Parties, the Expert took the first sample from a particular groundwater well, the second sample went to IEMS and the third sample went to GSI. See Expert's Direct Presentation, Slide 67.

881 Perenco alleged that the type of test that Ramboll's laboratory used to detect total petroleum hydrocarbons (TPH; sum of GRO, DRO and MRO), was "not specific to petroleum from crude oil" and "known to misidentify naturally-occurring plant waxes and insoluble paraffin wax, which fall in the same carbon range as petroleum on this analysis" and that there were stark differences between his analysis and what GSI found. The Expert addressed this during his Direct Presentation, starting at Slide 67, which noted that "Neither IEMS nor GSI has made their data available, nor provided necessary detail; thus, cannot comment on what is described as remarkably different results." Both Parties collected split ground water samples as part of Ramboll's 2017 field campaign, but their analytical data from that split sampling was never provided to the Expert by either Party so that the allegedly "stark differences" could be evaluated by him. In addition, the testing method used (EPA Method SW-8015C) was agreed to by both Parties in advance and had been used previously by GSI in its work.

882 The Tribunal considers such issues as the Parties' disagreements over Mr. MacDonald's treatment of background criteria, combining (or not) of data sets, use of the "upper predictive limit" method, the "chromatogram issue", the use of inference, predictive tools, macro-delineation, and contingencies to estimate the extent of contamination (and sensitivity analyses to confirm estimates), the merits and demerits of different methods of compositing soil samples, and so on to fall squarely within the province of expertise

samples, from extracting them at site through to transporting them to ALS, and their further analysis in Houston, Texas, was conducted in accordance with best practices and therefore rendered the technical evaluation of the samples valid, accurate and reliable.

747. To be sure, like the Parties, the Tribunal had questions about certain decisions taken by the Independent Expert. This was inevitable, given the manifold uncertainties inherent in estimating a single operator's legal responsibility for its slice of contamination that resulted from oilfield operations conducted in some parts of the Blocks for many years (particularly in Block 7 and the Coca-Payamino unified field).[883] The Tribunal's views on the Expert's determination of certain disputed issues is addressed below.

748. In the course of its deliberations, the Tribunal reviewed the Consolidated Independent Expert Report, the Parties' separate written submissions, as well as the testimony and closing submissions given at the Expert Hearing. Most of the questions and objections that the Parties have raised concern technical matters that fall within the Expert's expertise and judgement and the Tribunal considers that it is not appropriate to second-guess his technical determinations. That is why he was appointed in the first place: to provide, in an objective and neutral fashion, the expertise and judgement which the Tribunal considered the Parties' experts had failed to provide.

749. The Tribunal therefore considers that it is necessary for it to deal only with two major sets of issues. The first set of issues concerns how to determine Perenco's share of the responsibility for remediating the contamination in the Blocks (as between Perenco and its predecessors and successor). The second set of issues concerns the scope of the Expert's mandate and whether he acted consistently with it.

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and interpretation of results. These are quintessentially technical matters that the Expert dealt with and the Tribunal accepts his views on these matters.

883 Although there had been exploratory drilling in the Yuralpa and Oso fields, Perenco was the first operator to really develop them.

2. Causation and attribution of responsibility

750. Mr. MacDonald's estimation of the cost of remediating the "total measured contamination"[884] in Blocks 7 and 21 amounts to US$159,881.00.[885] The central question for the Tribunal is how much of this contamination is Perenco's responsibility.[886]

751. The Tribunal considered that the Expert's work should be focused on estimating the total measured contamination in the Blocks, leaving it to the Tribunal to decide the issues of causation and the resulting division of responsibility for remediation costs as between Perenco and other operators.[887]

752. The Interim Decision on Counterclaim made the following findings on how Perenco's responsibility would be fixed:

> "While it [the Tribunal] agrees with Perenco that it cannot presume that Perenco is the author of all harm that has been detected, once a regulatory exceedance resulting from a potentially hazardous activity is shown, Perenco is *prima facie* responsible therefor.[888]
> The Tribunal is thus inclined to employ a strong rebuttable presumption that if there is a regulatory exceedance, that in itself is evidence of fault. Any alternative approach would make it too onerous for a claimant because it would likely lack sufficient evidence to demonstrate that the operator failed in its duty of care in many if not most instances in which regulatory exceedances have occurred. The Tribunal considers that regulatory exceedances are indicative of operational failures and therefore should be taken as falling below the standard of care.[889]

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884 By "total measured contamination", the Tribunal means that amount of contamination which the Expert defined from prior investigations and his sampling in the Blocks as per the instructions of the Tribunal. Due to the limitations on his mandate, it is not to be taken as a complete estimation of total contamination in the Blocks because there could be contamination that was not detected by either of the Parties' experts and Mr. MacDonald was restricted to working on the sites that they had examined.

885 Independent Expert Report, Table 6.11. Summary of Remedial Cost Estimates.

886 Throughout this section of the Award, the Tribunal discusses different operators' "responsibility." Of course, the Tribunal only has Perenco and Ecuador before it. It can identify contamination which is attributable to the acts of Perenco's predecessors, but it lacks jurisdiction to assess damages payable by non-parties to the arbitration.

887 Interim Decision on Counterclaim, paragraph 591: "… the Tribunal recognises that the conditions likely to exist in 2015 might have been affected by the actions of Petroamazonas. It might therefore be necessary for the Tribunal to determine Perenco's share of any responsibility for contamination in order to ensure that it is not made responsible for the acts of Petroamazonas."

888 Interim Decision on Counterclaim, paragraph 372.

889 *Ibid.*, paragraph 374.

> In sum, if a regulatory exceedance occurred, Perenco is to be taken to have fallen below the requisite duty of care and will be held liable unless it can prove on a preponderance of evidence: (i) an occurrence of a *force majeure* event; (ii) that it did not fall below the standard of care in respect of that specific instance of contamination; or (iii) that some other person caused the harm."[890] [Emphasis added.]

753. In its comments on the Independent Expert Report and at the Expert Hearing, Perenco focused mainly on persuading the Tribunal that other operators are responsible for most of the contamination that has been determined by the Expert. Perenco's case was that its seven-year operatorship was sandwiched between other operations conducted by other operators for longer periods of time and therefore most of the damage found by the Expert must be attributed to those operators.

754. First, Perenco argued that most of the identified exceedances were attributable to prior operators because barium, which is associated with drilling, was identified and most of the well drilling occurred prior to Perenco's operatorship. Perenco also argued that at least some of the TPH exceedances stemmed from Ecuador's or other operators' tenures, during which major incidents had occurred.[891]

755. Second, for sites where it is difficult to allocate liability between Perenco and Ecuador, Perenco submitted that the application of a discounting factor based on length of operatorship may be appropriate, taking into account the full history of operations at a given site. [892]

756. Third, Perenco accepted its liability with regard to the contents of the mud pits that it had built and used. However, it contended that it cannot be held solely liable for pit cover material that showed near-surface exceedances unrelated to Perenco's drilling of the

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890 *Ibid.*, paragraph 379.

891 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 17.

892 *Ibid.*, paragraph 18.

associated wells.[893] It also denied liability for mud pits which were already closed by the time of Perenco's operations.[894]

757. At paragraph 735 above, the Tribunal has reproduced Perenco's proposed principles for allocating responsibility and they will not be repeated here.[895]

758. Ecuador took a very different view from Perenco, arguing that Perenco was under a duty to maintain the Blocks in good condition, which included remediating any environmental incidents as well as properly locating and constructing and/or closing mud pits.[896] However, Perenco "ran low-cost operations focused on extracting all the crude it could as fast as possible and at minimum cost, in complete disregard of the environment."[897] Ecuador argued that Perenco had failed to prove that the contamination (which was a minimum estimate[898]) was caused by prior operators or by Petroamazonas.

759. First, according to Ecuador, contemporaneous documents did not show environmental issues in the Blocks when Perenco took over. They also showed that the conditions of the Blocks declined and incidents occurred during Perenco's operatorship.[899] Further, Perenco's argument attributing responsibility to other operators based on barium was unsupported[900] and in any event, could have been caused by Perenco's workovers and transporting of drilling muds for storage.[901] Perenco could have done tests to assess the

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893 *Ibid.*, paragraph 19.

894 See Perenco's Closing Presentation, Slide 22.

895 *Ibid.*, Slide 93.

896 Ecuador's Comments to the Independent Expert Report dated 22 February 2019, paragraph 2: "Such extensive contamination obviously came as no surprise to Perenco, given its previously established sub-standard management of the Blocks, the numerous spills and other environmental incidents during its operatorship, its inadequate steps (to the extent undertaken) to remediate these incidents, its practice of concealing (or, at the very least not reporting) such incidents to the authorities, its inadequately located, constructed and/or closed mud pits, and its general failure to properly maintain the Blocks' facilities, including the flowlines, pipelines and tanks containing crude oil."

897 *Ibid.*, paragraph 2.

898 As Ecuador stated in its comments in the Consolidated Expert Report, p. 22: "MacDonald's conclusions should thus be viewed as the minimum discovered remedial needs."

899 Ecuador's Comments to the Independent Expert Report dated 22 February 2019, paragraphs 50-53.

900 *Ibid.*, paragraph 56.

901 *Id.*

timing of TPH exceedances (but it did not do so). In addition, incidents occurring prior to Perenco's operatorship occurred outside Mr. MacDonald's remediation locations.[902] In any event, Perenco inherited all environmental liability for any pre-existing conditions present in the Blocks.[903]

760. Ecuador argued further that Perenco also cannot attribute contamination to Petroamazonas because 11 of the sites and all mud pits identified for remediation were not operated or used by Petroamazonas.[904] Mr. MacDonald's gap-filling exercise confirmed the contamination found by IEMS and there were no new contamination incidents observed either during post-July 2009 inspections or by Ramboll.[905] Incidents occurring during Petroamazonas' operatorship took place at different locations or were such that they could not have caused the contamination found, and in any event, were promptly remediated.[906]

761. Second, Ecuador submitted that the allocation of responsibility for groundwater based on amount of time of each operatorship would: (i) reward an operator who concealed the existence of contamination for years and tactically seeks to deny liability such that it would be able to share responsibility with the next operator;[907] (ii) also unfairly impose exclusively on Ecuador the burden of the time taken by Mr. MacDonald to complete his report; and (iii) assume the same amount of contamination is generated every year regardless of each operator's practices, but the Tribunal cannot assume that Petroamazonas operates under the same low standards as Perenco.[908]

762. Third, Ecuador argued that Perenco is liable, at the very least, for the complete remediation of all the mud pits investigated by Mr. MacDonald because: (i) Perenco has the burden of proof regarding the placement of proper pits as it would have such records, but has failed

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902 Ecuador's Comments to the Independent Expert Report dated 22 February 2019, paragraph 55.
903 Ecuador's Closing Presentation, Slide 10.
904 Ecuador's Comments to the Independent Expert Report dated 22 February 2019, paragraphs 66 and 68.
905 *Ibid.*, paragraph 70.
906 *Ibid.*, paragraph 71.
907 *Ibid.*, paragraph 76.
908 *Ibid.*, paragraph 78.

to discharge that burden;[909] and (ii) there were many more mud pits that Mr. MacDonald should have investigated, but did not.[910]

(a) The Tribunal's Findings

763. The Tribunal considers that, as reflected in Perenco's general approach, there are two temporal aspects to the causation issue. The Tribunal accordingly begins with two fundamental principles.

764. First, the Tribunal agrees with Perenco that it cannot be held responsible for any contamination caused by Petroamazonas after it took over the Blocks in July 2009. As the Interim Decision on Counterclaim stated:

> "368. The Tribunal recognises that with the passage of time, in the course of conducting oilfield operations, Petroamazonas might have caused spills and other contamination. The key period of time was that falling between July 2009 and the time in which the Parties' experts conducted their sampling activities. During this period, it is possible that the condition of the Blocks could have been adversely affected by the succeeding operator and this must be borne in mind. To the extent that there is any evidence of environmental harm occurring in the Blocks during the post 16 July 2009 period, Perenco bears no liability. Under the 2008 Constitution, Petroamazonas is strictly liable for any such contamination."[911]

And:

> "370. The Tribunal finds that the only remediation obligation that Perenco can have is for regulatory exceedances that predate Petroamazonas' activities and which themselves have not been overtaken by Petroamazonas' new works."[912] [Emphasis added.]

765. Second, although Perenco is *prima facie* liable for all contamination in the Blocks, it cannot be held responsible for any contamination that the evidence shows was caused by other operators prior to its assumption of operations in 2002.

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909 Ecuador's Closing Presentation, Slide 18.

910 *Ibid.*, Slide 19.

911 Interim Decision on Counterclaim, paragraph 368.

912 *Ibid.*, paragraph 370.

766. The Tribunal will discuss each in turn.

(b) The Petroamazonas issue

767. The Tribunal is alive to the possibility that given the effluxion of time, Petroamazonas could have caused contamination that could be erroneously attributed to Perenco. Insofar as the sampling exercises are concerned, there are two time periods to be considered. First, due to the 15-month period between Perenco's suspension of operations and the beginning of IEMS' first sampling campaign, it is possible that contamination caused by Petroamazonas could have been discovered by the Parties' experts when they sampled the Blocks. Second, it is also possible that the sites that were sampled by the Tribunal's Independent Expert could have been contaminated during the period between the end of the Parties' experts' sampling and the time when Ramboll conducted its sampling activities.

768. This is not an academic issue. During the original hearing on the counterclaim, Perenco directed the Tribunal to examples of Petroamazonas having experienced spills after it took over operations in the Blocks.[913] In its written submissions on the Independent Expert Report and at the Expert Hearing, Perenco continued to refer to evidence of spills caused by Petroamazonas.[914]

769. In the period leading up to the March 2019 Expert Hearing, the Tribunal considered whether a discounting factor of some type, having regard to the two operators' respective tenures in the Blocks, might be appropriate, but it formed no firm view on the matter. In Procedural Order No. 17, issued after the receipt of the Independent Expert Report and in

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913 See Perenco's Post-Hearing Submission on Counterclaims dated 6 November 2013, fns. 96 and 100, referring to CE-CC-360 regarding Petroamazonas' 2012 spill at Yuralpa Pad E and CE-CC-357 regarding Petroamazonas' 2011 spill at Coca 6.

914 See Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 12: "It has also experienced dozens of spills that it only very recently disclosed, and even more spills that it did not disclose. For instance, in May 2012, *El Comercio* reported on the 'Fifth Spill of Hydrocarbons in Ecuador this Year,' noting that there had been 'one spill per month in oil Blocks operated by Petroecuador and Petroamazonas,' including in Block 21. Petroamazonas also reported spills that occurred on 1 March 2015 at undisclosed locations in Payamino; on 16 September 2009, in Payamino; and on 4 January 2014 in Oso 9." See also fns. 18 and 20, referring to the following: CE-CC-438 (2011 Spill Report for Coca 6), CE-CC-439 (2011 Investigation Report for Incident in Coca 18-19), CE-CC-440 (2012 Spill Report for Yuralpa Pad E), CE-CC-443 (2016 Investigation Report for Payamino B) and CE-CC-444 (2017 Investigation Report for Oso CPF).

anticipation of the Expert Hearing, the Tribunal invited the Parties to address this issue in their written submissions:

> "On the separate issue raised in the correspondence, namely, the question of sorting out issues of causation for those sites which have been successively worked by Perenco and Petroamazonas, the Tribunal has been considering how to attribute liability in such circumstances. It considers that the issue will to some extent be clarified by the production of documents contemplated in this order. Once a fuller picture of Petroamazonas' possible contribution to any identified contamination is developed, the Tribunal will be in a better position to determine how to proceed. The Tribunal reminds the Parties that the estimation of damages is not a scientific exercise and it might be necessary to employ a general discounting factor in order to arrive at a just and reasonable award. The Parties are encouraged to address this issue in their written submissions."[915] [Emphasis added.]

770. As a result of the document production exercise, the Parties' focused written submissions, and the testimony and oral submissions at the Expert Hearing, the Tribunal has arrived at a better understanding as to how to deal with the Petroamazonas issue.

771. Starting with the first period of time, the Tribunal notes that the period of time elapsing between Petroamazonas' assumption of operations and IEMS' first sampling campaign was some 15 months.[916] Although it cannot be completely ruled out that some contamination was caused by Petroamazonas prior to IEMS commencing its work (or during the time that it took IEMS and GSI to complete their studies)[917], the Tribunal is satisfied that it is unlikely that one or the other of the Parties' experts, particularly Perenco's experts, would have identified any new contamination that they thought occurred *after* Perenco's operatorship and included it as being caused by Perenco.[918]

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915 Procedural Order No. 17, paragraph 15.

916 IEMS' work commenced in the fourth quarter of 2010 and although IEMS did not identify all of the areas in respect of which it ultimately claimed contamination was found, it did do a substantial amount of initial sampling during the October – November 2010 period.

917 See *e.g.* GSI ER I, paragraph 201, noting that the results of their site inspections showing operating deficiencies which in GSI's opinion pertained to the operating practices of Petroamazonas. See also Saltos WS I, paragraphs 302 and 310 -318.

918 Ecuador argued that the areas evaluated by the Expert were those that IEMS had evaluated since 2010. "In addition, no recent contamination caused by the current operator has have (sic) been witnessed by any of the actors that have been inspecting the Blocks since 2010 (the Consortium's experts and representatives

772. With respect to the second period of time (the period of Petroamazonas' operation between the completion of IEMS'/GSI's work and the commencement of Mr. MacDonald's work), the Tribunal notes that the "territorial bounds" of the Independent Expert's sampling exercise were defined principally by IEMS (because GSI viewed its mandate as being mainly one of checking the sites previously sampled by IEMS).[919] Insofar as there might have been supervening contamination caused by Petroamazonas, the Tribunal considers that the risk of attributing any such contamination to Perenco has been substantially reduced by the Independent Expert's circumscribed mandate to sample only at those sites which were previously sampled by the Parties' experts (Perenco's mud pits excepted; see below) and by other steps explained below.

773. Had the Independent Expert been instructed to conduct a *de novo* investigation, he could well have identified contamination caused by Petroamazonas which occurred outside of the sites previously identified by IEMS/GSI. But his restricted mandate reduced the likelihood of that occurring. Since the initial IEMS data were collected within a relatively short period of time after Perenco ceased operations, IEMS' identification of allegedly contaminated sites effectively serves as an "environmental conditions baseline." Any Petroamazonas spills and releases occurring outside of the sites where IEMS and/or GSI sampled were not legally relevant to the Independent Expert's task.

774. The only possibility for the Independent Expert's erroneously capturing more recent contamination by Petroamazonas to Perenco would be if Petroamazonas were to have contaminated a site where exceedances were previously identified by either or both of the

included) nor were reported by MacDonald during his visit in October/November 2016 or during his 4-month field campaign in the fall of 2017. " Consolidated Expert Report, p. 10.

919 Interim Decision on Counterclaim, paragraph 234: "In its first report of 20 September 2012, GSI noted that it had been tasked to 'provide an objective evaluation of the work conducted by IEMS and, at the same time, achieve a comprehensive assessment of current environmental conditions for each of the 74 oilfield facilities investigated by IEMS.'" The Consolidated Expert Report noted at p. 14: "GSI's primary approach was to either refute the RECs or refine the extent of contamination identified by IEMS (This was not their exclusive effort; GSI also identified additional RECs based on their own field observations and due diligence)."

Parties' experts and the Expert could not differentiate between the new contamination and the old.

775. A safeguard against that possibility was the Tribunal's direction in the Interim Decision on Counterclaim that:

> "The Parties will be permitted to attend when the expert and his/her team carries out the necessary investigations and the Parties will receive a copy of the expert's report and will be permitted to comment thereon in due course."[920]

776. The Parties accepted this invitation. The Independent Expert noted that he discussed many issues pertaining to the sampling exercise with Parties' representatives during the process of organising his work and that Party representatives were present when the Independent Expert and/or his team conducted their activities in the Blocks.[921] An example of the Parties' ability to monitor Ramboll's field work is recounted in the Consolidated Independent Expert Report. The Report noted that when surface soils were to be sampled at the Gacela 02 site, GSI expressed concern about the soils potentially being affected by recent vegetation-control burning activities believed to have been conducted using diesel fuel as an accelerant.[922] As a result, Ramboll collected additional samples from the uppermost 10 cm soil interval; Mr. MacDonald reported that the Parties agreed that the results from these samples should satisfy GSI's concern.[923]

777. Given this attention to detail, in the Tribunal's view, it is most unlikely that GSI would have failed to point out recent contamination to Ramboll if it had spotted any. There is no indication that they did so.[924] The presence of the Parties' own representatives thus served

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920 *Ibid.*, paragraph 588. See also paragraph 611(19).

921 Consolidated Expert Report, p. 3; Tr. (1) (MacDonald) (11 March 2019), pp. 129, 130 and 131.

922 Consolidated Expert Report, fn. 191.

923 *Id.*

924 Rather, Perenco and its technical representatives raised various objections on the basis that Ramboll was sampling in locations for which prior work of IEMS and GSI revealed no exceedances or that were already well delineated or choosing locations not confined to sampling locations identified previously by IEMS or GSI, which Perenco alleged to be outside the scope of the Expert's mandate (see the correspondence of 13 September 2017 and 14 November 2017). Perenco also objected to Ecuador's attempt to have Ramboll consider locations where there was "visual evidence" of potential contamination (see its letter of 14

to further reduce the possibility that any contamination caused by Petroamazonas since the time of IEMS' and GSI's sampling campaigns will be wrongly attributed to Perenco.

778. Nevertheless, because an undetected layering of spills cannot be ruled out, the Tribunal took a further step in agreeing with Perenco that Petroamazonas' spill reports and related documents should be produced to Perenco. This would enable the Parties to cross-check the sites identified in those documents against the sites identified by the Independent Expert to see whether any of the contamination he had identified could have been caused by Petroamazonas.

779. The Tribunal found Perenco's initial request for the production of documents to be overly broad in that it asked the Tribunal to:

> "…direct Ecuador to immediately produce all relevant documentation pertaining to the environmental condition of the Blocks post-July 2009. Based on information in the record and publicly available information, that documentation should include annual environmental reports, bi-annual environmental audits, internal monitoring reports, oil spill reporting records, work orders issued by Petroamazonas to contractors assessing, mitigating, managing, or remediating potential environmental impacts in the Blocks, and any transactional documents with new operators describing the environmental conditions in the Blocks post-July 2009."[925]

780. The Tribunal decided that while this request was properly motivated and made timeously, it should be more narrowly focused on whether Petroamazonas caused any spills *at the particular sites identified by the Independent Expert as requiring remediation*. It was unnecessary to require production of documents relating to any sites which were excluded from his investigation[926] or where the Independent Expert did not find contamination

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November 2017). The Tribunal notes Ramboll's letter of 28 December 2017 in response to Perenco's letter of 14 November 2017, where the Expert noted that there had been consistent dialogue with the Parties throughout the scoping and implementation process related to field activities and that the Parties' technical representatives were present when the locations of the monitoring wells and other testing locations were field-marked in August, as well as throughout the entire sampling programme, including during the groundwater monitoring well installations, which commenced in mid-September 2017.

925 Procedural Order No. 17, paragraph 2.

926 See the Consolidated Expert Report, section 4.2, Site Screening, which lists in Table 4.1, Sites Omitted from Ramboll's Investigation, in Table 4.2, Sites Where Soils Not Further Investigated, and in Table 4.3, Sites

because the rest of the Blocks fell outside of his mandate. Procedural Order No. 17 therefore directed that:

> "… as contemplated in Ecuador's offer quoted above at paragraph 11 [of Procedural Order No. 17], only documents relating to those sites are relevant for the purpose of the estimation of damages. The Tribunal believes that Perenco is entitled to have access to such documents and it would not be unduly burdensome for Ecuador to produce them on a rolling basis."[927]

781. After the order was issued, starting on 29 January 2019, Ecuador began to produce responsive documents, namely, annual environmental reports of Blocks 7 and 21 as well as spill and clean-up reports for sites identified by the Tribunal's Expert as requiring remediation.[928] Ecuador informed the Tribunal that within two weeks of the order, it had provided some 120 documents relating to environmental incidents during Petroamazonas' operatorship of the two Blocks.[929] By letter dated 7 February 2019, Ecuador stated that it produced 214 responsive documents to Perenco (and that this had been acknowledged by Perenco on 5 February 2019[930])[931]; and on 12 February 2019, Ecuador provided additional

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Where Mud Pits Not Further Investigated, and section 4.2.4, which listed groundwater excluded from further consideration.

927 Procedural Order No. 17, paragraph 14.

928 See Ecuador's letter of 29 January 2019, p. 1.

929 See Ecuador's letter of 31 January 2019, p. 1. "Ecuador informs the Tribunal that it produced additional documents (including the Petroamazonas' Resolution No. 099-PAM-EP-CON-2017 mentioned by Perenco in its 25 January 2019 letter) today. A reasonable search for additional potentially responsive documents is still ongoing Ecuador will produce any additional responsive documents (if any) without delay."

930 See Perenco's letter of 5 February 2019: "Unfortunately, although on January 29 and 31, 2019 Ecuador produced 214 documents, this production is neither complete nor satisfactory. Ecuador has produced annual environmental reports for Blocks 7 and 21, as well as some spill and clean-up records of incidents that occurred since 2009. However, it has not produced: (i) any biannual reports for Blocks 7 and 21, (ii) reports of other environmental incidents that occurred post-July 2009 at the sites Mr. MacDonald has identified for remediation, or (iii) work orders issued by Petroamazonas to contractors assessing, mitigating, managing or remediating potential environmental impacts at relevant sites, and that would contain information on the remediation costs that Petroamazonas has actually incurred to address environmental impacts at relevant sites. For the reasons Perenco has already explained, and the Tribunal acknowledged in Procedural Order No. 17, this information is critical to ensure that Perenco is not being held liable for the acts of its successor – especially when that successor is Ecuador, the counterclaimant here. Ecuador's belated and incomplete production is highly prejudicial to Perenco and grossly unfair. Ecuador must forthwith make a more complete production."

931 Ecuador's letter of 7 February 2019, p. 1, responded to Perenco's complaints: "In spite of acknowledging having already received 214 responsive documents from Ecuador on very short notice, Perenco qualifies

documents to Perenco.[932] Ecuador's comments in the Consolidated Independent Expert Report note that it produced some 2500 responsive documents to Perenco.[933]

782. Although Perenco complained about the extent of Ecuador's compliance with the Tribunal's order[934], it did not place much emphasis on such complaints.[935] Both Parties have been represented in this arbitration by capable counsel and the Tribunal is loath to find that Ecuador did not produce the relevant Petroamazonas documents pertaining to spill incidents in the areas of concern to the Expert. It proceeds on the basis that Ecuador duly complied with the terms of Procedural Order No. 17.

783. The Tribunal has taken further note of the fact that at the Expert Hearing, Perenco did not direct the Independent Expert to many of the Petroamazonas spill reports.[936] This suggests that the documentary evidence produced to Perenco was not as supportive of its contention

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Ecuador's 'production [as being] neither complete nor satisfactory' in a misguided effort to discourage the Tribunal from allowing the introduction of records of workovers performed by Perenco. Yet, Ecuador has complied (and continues to undertake its best reasonable efforts to comply) with PO 17." Ecuador added: "Ecuador commenced disclosing responsive documents to Perenco, on a rolling basis, on 29 January 2019 (i.e., only 14 days after PO 17) by producing a first back of some 100 post-July 2009 spill clean-up reports. Subsequently, on 31 January 2019 Ecuador disclosed over 100 documents (including annual environmental audits for Block 7 and 21 since 2010). In sum, Ecuador has produced over 200 documents within two weeks from the Tribunal's order." Finally, Ecuador responded to Perenco's complaint that it was not providing reports for relevant sites: "Ecuador can confirm that there are no records of any spills during Petroamazonas' operations at 24 sites. There are, therefore, no additional spill reports to be disclosed." Finally, Ecuador indicated that Petroamazonas had recently advised that it identified additional responsive documents including the biennial audits conducted at Blocks seven and 21 which Ecuador would promptly disclose as soon as they were retrieved.

932 See Ecuador's letter of 12 February 2019, which stated: "Ecuador hereby informs the Tribunal that it has produced additional documents to Perenco today."

933 Consolidated Expert Report, p. 250.

934 See Perenco's letter of 5 February 2019 quoted above. In addition, Perenco's 22 February 2019 submission stated at paragraph 12: "Ecuador's eleventh-hour document production leaves a picture that is far too incomplete to adequately depict ten-years' worth of [Petroamazonas'] operations' environmental impacts."

935 See Perenco's Closing Presentation, Slides 81 and 84 regarding its allegation that Ecuador failed to disclose certain environmental incidents and Ecuador's representation that Lobo 4 had not been operated after 2009.

936 The main example being a Petroamazonas spill at Coca 6. See Tr. (1) (MacDonald) (11 March 2019) 173-175, Mr. Friedman's cross-examination of Mr. MacDonald with respect to the spill at Coca 6.

that a substantial amount of the contamination identified by Mr. MacDonald should be attributed to Petroamazonas' activities as Perenco had hoped.[937]

784. There seems to be a good reason for this: having regard to the documentary evidence produced by Ecuador, it appears that 35 spills and releases were reported to have occurred in the relevant areas since July 2009.[938] They were mainly small quantity spills or releases that were remediated or occurred within secondary containment. More important for the Tribunal's determination is that *26 of the 35 spills evidently occurred away from areas identified by Mr. MacDonald as contaminated or at sites where his conceptual remediation plan addresses only mud pits that were constructed and used by Perenco*. Further, five of the spills occurred at sites where the remediation plan addresses elevated metal concentrations (*e.g.*, barium). Moreover, there is no mention in the Independent Expert Report of any recent spills witnessed at sites where Ramboll tested. This led Ecuador to assert that while the Expert observed crude oil in swampy areas at some sites (*e.g.*, Coca 2 and Payamino 2/8), he did not observe conditions that would indicate recent releases.[939]

785. In sum, in relation to what might be called the 'Petroamazonas temporal issue', given the totality of the circumstances (including the Independent Expert's restricted mandate, his and his team's consultations with the Parties' experts and counsel throughout his sampling activities, and the spill reports and other documents produced by Ecuador), the Tribunal has concluded that the use of a generally applicable discounting factor based *exclusively* upon a split between the length of time that Perenco and Petroamazonas' operated in the Blocks would, by itself, be too crude a method of allocating responsibility and insufficiently connected to the record evidence. The Tribunal concluded that a closer look

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937 Although counsel argued in favour of a discounting factor with respect to soil and groundwater remediation costs based on the relative length of time of Petroamazonas and Perenco in the operation of the Blocks, it pointed to little evidence drawn from the spill reports and other documents produced to it to prove that any of the contamination that had been estimated by Mr. MacDonald was attributable to Petroamazonas. Tr. (1) (MacDonald) (11 March 2019) 173-176, 222-223; Tr. (2) (MacDonald) (12 March 2019) 460.

938 E-460.

939 Consolidated Expert Report, p. 10, point 7: "The areas evaluated by MacDonald were those that IEMS had evaluated since 2010. In addition, no recent contamination caused by the current operator has have been [*sic*] witnessed by any of the actors that have been inspecting the Blocks since 2010 (the Consortium's experts and representatives included) nor were reported by MacDonald during his visit in October/November 2016 or during his 4-month field campaign in the fall of 2017."

at the sites where contamination was found was required before using any discounting factor based on, for example, the respective length of the two operators' tenures.

(c) Contamination caused by prior operators

786. The second temporal issue, namely, the possibility of Perenco being wrongly held accountable for contamination caused by prior operators is, in the Tribunal's view, a much more significant and difficult issue.

787. Resolving this issue is complicated by the fact that Perenco's documentary evidence of its own evaluation of the Blocks' condition in 2002 was non-existent. Mr. Wilfrido Saltos testified that an evaluation of the Blocks was performed when Perenco acquired its interests, but when requested, Perenco was unable to produce any written audit of the Blocks prepared by or for it in order to ascertain their condition at the time of acquisition.[940] The most it could show was that it obtained a representation and warranty from the seller, Kerr-McGee, that the latter had complied with all applicable Ecuadorian laws relating to the environment, with the exception of certain matters listed in two schedules to the contracts.[941] One of the schedules, Schedule 3.9(a), was admitted into the record earlier in this proceeding.[942]

788. The Tribunal considered Schedule 3.9(a) to be of some assistance to ascertaining the state of the Blocks' environmental condition in 2002. It noted:

> "For present purposes, while the Tribunal considers that Schedule 3.9(a) provides a helpful contemporaneous assessment of the Blocks, it cannot be considered to be a definitive and exhaustive analysis of their environmental condition. There might have been contamination of which Kerr-McGee was unaware or which it might have failed to disclose. There is no indication that Perenco challenged Kerr-McGee's list of noncompliant issues by informing it of contamination or other regulatory problems which had not been disclosed to it under Schedule 3.9(a) nor is there any evidence of Perenco's having ever complained to Kerr McGee that it had made anything other than an accurate disclosure. Schedule 3.9

940 Interim Decision on Counterclaim, paragraphs 386-388.

941 *Ibid.*, paragraphs 392-393.

942 *Ibid.*, paragraph 394.

> (a) thus provides a starting point for distinguishing between any contamination that might have occurred prior to Perenco's acquisition of its interests and any contamination which occurred thereafter."[943] [Emphasis added.]

789. Schedule 3.9 (a) was thus one helpful piece of evidence, a starting point, but hardly dispositive of the question of the Blocks' environmental condition.

790. The other schedule, Schedule 3.9(b), which listed all wells in the Contract Area and a description of their status, was not included in Perenco's redacted version of the Purchase and Sale Agreement produced earlier in the counterclaim proceeding. The Tribunal considered that this should be produced in the next phase of this proceeding because it might shed additional light on the condition of the Blocks in 2002.[944] Schedule 3.9(b) was duly produced by Perenco, but it only lists the status of each well in the Blocks at the time of acquisition and provides no additional insight into their environmental condition.[945]

791. The Tribunal also considered that if the Parties were unable to settle this part of the case on the basis of the Interim Decision on Counterclaim's findings and the Tribunal had to proceed to this phase of the proceeding, it would be helpful to examine DINAPA-CSA-1602001-20001697 of September 2001, if a copy of that letter could be located, because it set out the authority's view of what needed to be done at the time in order to bring the Operator into compliance with its legal obligations.[946] This was duly submitted by Ecuador as E-445. Regrettably, it did not advance matters. A comparison of DINAPA's 4 September 2001 inspection letter to Schedule 3.9(a) shows that the Schedule essentially reproduces it.

792. The Tribunal recalls its prior discussion of the evidence as to the environmental conditions of the Blocks at the time of Perenco's acquisition of its interests in the Production Sharing Contracts:

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943 *Ibid.*, paragraph 398.

944 *Ibid.*, paragraph 399.

945 CE-CC-432, produced under cover of Perenco's letter dated 25 January 2019. The schedule listed some 50 producing wells, 10 shut-in wells, three P & A wells ("plugged and abandoned"), one TA well ("temporarily abandoned") and three water disposal wells in Block 7; and two plugged and abandoned wells, seven temporarily abandoned wells, and one testing well in Block 21.

946 Interim Decision on Counterclaim, paragraph 397.

> "In both the Parties' written pleadings and in their experts' reports, there was considerable debate over whether certain instances of contamination were attributable to the actions of Perenco or to other parties who carried on operations in what became Blocks 7 and 21 before Perenco arrived on the scene. In view of the Tribunal's finding that under the fault-based regime Perenco can avoid liability if it can demonstrate that a particular instance of contamination resulted from the acts of another person, this necessarily requires the Tribunal to consider the environmental conditions of the two Blocks at the time that Perenco acquired its interests from Kerr-McGee."[947]

793. The Interim Decision on Counterclaim reviewed evidence of prior contamination which was submitted by Perenco.[948] Perenco returned to some of this evidence during its closing submissions in the latest phase of this proceeding.[949] It also made the important point that Ecuadorian environmental law has become more rigorous over time.[950]

794. Drilling in the Coca-Payamino unified field dates back to 1971, with successive operators CEPE and BP, *Petroproducción*, Oryx, then *Petroproducción* again, and then Kerr-McGee, all preceding Perenco's entry into that field some 30 years after CEPE and BP first conducted exploratory drilling.[951]

795. In Block 7, CEPE and BP, Kerr-McGee and *Petroproducción*, then Kerr-McGee, all operated prior to Perenco. Unsurprisingly, more wells were drilled by the preceding operators in the Coca-Payamino unified field and Block 7 (Oso excepted) than by Perenco itself. [952]

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947 *Ibid.*, paragraph 380.

948 *Ibid.*, paragraphs 405 and footnotes 926, 927 and 934.

949 Perenco's Closing Presentation, Slides 61-67.

950 Tr. (2) (MacDonald) (12 March 2019) 513:17-514:3: "You are being confronted with old legacy liabilities, for the most part, things that happened a long time ago under a different regulatory regime. They might not have even been violations of the environmental regulations at the time, but, nevertheless, they occurred on the State's watch or at a time when operations were for the State's benefit, and Perenco had no role in it. Perenco was not even in the picture."

951 GSI prepared a Table in Appendix B.4 to its first expert report which listed on a site by site basis, the drilling of certain wells (Payamino 02-08, Mono CPF/Mono 1-5/1W, Payamino 1, Gacela 01-08, Coca 18-19, Coca 01, Coca 04, Coca 06, Coca 08, Coca CPF, Gacela 02, Jaguar 02, Jaguar 07-08, Mono Sur / Mono 6-9, 11, Payamino 04, and Yuralpa Pad A) by Perenco's predecessors and the effects of such drilling.

952 Perenco's Closing Presentation, Slide 4. GSI ER I, paragraph 160: "Of the 95 wells completed in the CPUF and Block 7 areas by 2009, 68 (71%) were drilled prior to 2002. Consequently, soil impacts related to drilling

796. In Block 21, which does not have as long a history as Block 7[953] (Perenco itself characterised Block 21 as a "greenfield development project" because there was "no oil producing infrastructure"[954]), Kerr-McGee preceded Perenco.[955] Indeed, of the 77 wells listed in Schedule 3.9(b) to the Kerr-McGee Purchase and Sale Agreement, only nine were located in Block 21 and none of them were operating at the time of acquisition.[956] Insofar as the wells at the Yuralpa field in Block 21 are concerned, Perenco drilled the lion's share of those wells[957] until Petroamazonas began operations.[958]

797. It appears that some 84 spills and releases were reported to have occurred prior to September 2002, of which four were not specifically tied to a site but only to Block 7 or an oilfield (*e.g.*, Coca, Mono-Jaguar, Payamino).[959] GSI also used a somewhat lower number;

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activities at those pre-2002 sites would be associated with prior operators, not the Consortium. Indeed, available information indicates that some wells drilled prior to 1990 were completed without use of mud/cuttings pits, resulting in discharge of excess drilling mud and cuttings to the surrounding area."

953 It appears that Yuralpa 1 was drilled in 1972 by Texaco. See GSI ER I Appendix B.4. The next wells to be drilled were Yuralpa Centro 1 (October 1997), Dayuno 1 (September-October 1987), Sumino (an injection well) (May 1998), Yuralpa Centro 2 (April 1999), Nemoca (December 1999), and Waponi and Ocatoe (both in August 2000).

954 In its Revised Memorial dated 5 August 2011, Perenco asserted at paragraph 42: "Block 21 is a 155,000 hectare plot several hundred kilometers east of Quito. LC WS ¶ 4. At the time Perenco acquired its interest in Ecuador, Block 21 was literally a greenfield development project: there was no oil producing infrastructure."

955 Perenco's Closing Presentation, Slide 3.

956 CE-CC-432. The wells are Yuralpa-1, Dayuno-1, Yuralpa C-1, Chonta-1, Sumino-1, Yuralpa C-2, Nemoca-1, Waponi-1, and Ocatoe-1. The first two were 'plugged and abandoned' and all of the rest were 'temporarily abandoned'.

957 See GSI ER I Appendix B.4, pp. 4-5.

958 Perenco noted, at paragraphs 45-47 of its Revised Memorial, dated 5 August 2011, that: Block 21 was essentially a "greenfield development project" because there was no there was "no oil producing infrastructure." Perenco stated: "by the end of the first quarter of 2004, the Consortium had brought production from zero to close to 22,000 barrels a day." However, due to a "technical setback [which] caused a drop in the production of Block 21's most productive wells which, at the time, had been producing approximately 12,000 barrels per day… Perenco was forced to drill additional wells that were not originally contemplated and to commit additional capital to restore production." "Consequently, by the end of the first quarter of 2006 – when Ecuador enacted Law 42 – the Consortium had invested $197 million in Block 21… It had drilled over 25 production wells, as opposed to the 12 originally contemplated, and was producing nearly 16,000 barrels per day."

959 See Appendix B of GSI ER I and the 1998 Grizzle Report. See also summary table from Perenco Ecuador to DINAPA, Technical Report – Environmental Characterization of Platform Payamino 2-8 ("Walsh Report"), and Records of Petroamazonas' post-July 2009 spills (provided by Ecuador as Exhibit E-460 submitted with its comments on the Report by the Tribunal's Expert on February 22, 2019).

it included with its first expert report in 2012 as Appendix B.3, which identified 55 "pre-Perenco" spills and releases.[960] A brief description of the nature and quality of the release and any recovered product was included in the summary table. At 11 of these sites, the reported releases were more than 20 barrels, and some of these releases were reportedly significant (*i.e.*, 150 barrels at Coca 8 and 110 barrels at Gacela 6). However, GSI did not provide details on, among other things, where the releases took place within a given site, what media was affected (*e.g.*, soil, surface water), how the affected media were addressed (if at all), or provide the supporting documents used by it in order to create its summary table.

798. That said, the Tribunal accepts the thrust of Perenco's position that there had to be pre-existing contamination because there is evidence to support the findings that: (i) the Ecuadorian legal framework governing the environmental aspects of oilfield operations was less rigorous than RAOHE and TULAS (the former promulgated in 1995 and then amended in 2001 and the latter promulgated in 2003[961]); and (ii) at least some operators' practices were conducted to that less rigorous standard in the 1980s and 90s.

799. For example, an internal environmental assessment report on the Coca-Payamino field prepared for Oryx in 1994 by Patrick Grizzle and Nancy Sahr (when Oryx took over operations in that field), was troubling. In addition to identifying various practices which needed improvement, the report noted:

> "There is presently no reporting or written procedures within *PetroProducción* [sic] for environmental pollution or spill incident reporting. An incident reporting system should be put in place as soon as possible."[962] [Emphasis added.]

800. The 1994 report unfortunately contained no results of sampling and analysis. The authors thought from a visual inspection that the contamination was "minimal", but added that: "as

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960 GSI ER I, Appendix B.3.

961 Interim Decision on Counterclaim, pp. iii-iv.

962 *Ibid.*, paragraph 383, quoting Exhibit E-261, Environmental Assessment of Oryx Ecuador Energy Company, Coca-Payamino Field dated May 1994, p. 6.

this study did not include sampling and analysis, no confirmation of contamination levels can be made."[963] In the Tribunal's view, it is more likely than not that *Petroproducción* and other operators at the time caused damage, but there is little in the way of hard information as to the extent of the contamination that might have resulted from the laxity in environmental practices at that time. As the Tribunal previously noted when it discussed the issue in the Interim Decision on Counterclaim, visual inspections are important, but in and of themselves are not sufficient to identify and determine the extent of contamination.[964]

801. There is some evidence that some of the spills identified in 1994 at least were remediated. The March 1996 Internal Environmental Audit of Oryx Ecuador Operations, also performed by Mr. Grizzle and Ms. Sahr, which followed up on a 1995 audit, noted that:

> "Several environmental issues were noted during the audit. Several of these were noted in the 1995 Audit and some have been corrected or partially corrected."[965] [Emphasis added.]

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963 *Ibid.*, paragraph 382, quoting Exhibit E-261, Environmental Assessment of Oryx Ecuador Energy Company, Coca-Payamino Field dated May 1994, p. 4.

964 *Ibid.*, paragraph 409: "…The Tribunal agrees with Ecuador that the fact that rapid growth of vegetation might obscure a visual inspection of contaminants, does not mean that they disappear for remediation purposes. Hence, while as GSI emphasised, visual inspections are an important part of conducting a thorough assessment, they are hardly adequate to the task of ascertaining the extent of contamination and the Tribunal is not content to rely upon an expert's visual evaluation." Perenco itself pointed this out, at paragraph 266 of its Rejoinder on Counterclaims, when commenting on the various audits performed when Oryx was the operator, specifically in relation to the Jungal swamp/Payamino 2-8 contamination: "Comments in later audits that the area affected by a subsequent 1991 spill by Petroproducción 'has been revegetated and is doing well' would not establish that this was due to remediation, whether of the 1991 spill or the 1987 incident. Today, the *Jungal* swamp is still heavily vegetated, appears to be doing well to the naked eye, and shows no obvious signs of contamination, yet both IEMS and GSI have confirmed TPH and barium exceedances in that location." There is also evidence of crude oil both on the slope leading to the swamp and within the swamp itself.

965 E-262, Environmental Assessment of Oryx Ecuador Energy Company, Coca-Payamino Field, dated May 1994, p. 4. The 1998 report noted further improvement: "Several general environmental issues were noted during the audit. Several of these were noted in the previous audits and most have been corrected or partially corrected. In general, better environmental practices were noted in the 1998 as compared with the 1997 audit." E-264, Environmental Assessment of Oryx Ecuador Energy Company, Coca-Payamino Field dated 22-23 June 1998, p. 1.

802. The 1998 Grizzle report, commissioned at a time when Oryx was negotiating to take over the operation of the Coca-Payamino field, followed the same format and general content of the previous years' reports. The report essentially provided a photographic snapshot of conditions at 27 sites. It generally shows that, other than a single spill at Coca 6, historical events can be described as small quantity spills or releases that seemed to result from poor operation and maintenance practices (*e.g.*, leaky valves and flanges, damaged secondary containment systems, overflowing oil/water separators, overfilling of diesel tanks). The most significant and largest quantity of spills were observed within the CPFs (Coca CPF and Payamino CPF) and not the platforms.[966] In the end, the 1998 Grizzle report did not seek to identify the specific releases, to estimate quantities, or to ascertain when the releases occurred.

803. The Interim Decision on Counterclaim noted that:

> "… when Oryx was negotiating to resume the operatorship of the Coca-Payamino Field (it evidently had been operated by *Petroproducción* for some eighteen months), a Mr. Patrick Grizzle (who appears to have been an Oryx employee) conducted an inspection from 12 to 14 January 1998. Mr. Grizzle's view was that environmental conditions had deteriorated in the period during which the field was being operated by *Petroproducción* and he was critical of its operatorship. Oryx had operated the field from 1995 to 1997 and Mr. Grizzle recorded what he viewed as backsliding from many of Oryx's better practices. He appears to have reached this conclusion entirely on visual inspections (many photographs are attached to the report). Once again, according to the report, no sampling of soils, surface water or groundwater were taken."[967] [Emphasis added.]

804. It is not in dispute between the Parties that in the period leading up to Perenco's suspension of operations in July 2009, most of the production wells in the Block 7 and the Coca-Payamino field (excluding Oso) were drilled before Perenco arrived in Ecuador. In its Closing Presentation, Perenco listed 57 wells that pre-dated its operatorship of Block 21. (In contrast, it listed 15 wells for which it appeared to take responsibility in that Block.[968])

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966 The Tribunal itself noted in its Interim Decision on Counterclaim, at paragraph 405, that the record evidence indicated "some problems with the Coca-Payamino Field and the Oso 1 platform" which predated Perenco's operatorship.

967 Interim Decision on Counterclaim, paragraph 385 [footnote references omitted].

968 Perenco's Closing Presentation, Slide 4.

805. Given the Grizzle-Sahr reports, in particular, the comments on *Petroproducción*'s backsliding (quoted in paragraph 385 of the Interim Decision on Counterclaim just noted) and various other pieces of evidence pertaining to wells that were drilled before Perenco's operatorship, the Tribunal is reluctant to rely upon the Purchase and Sale Agreement's schedules as constituting an exhaustive and definitive statement of the Blocks' environmental condition. The Tribunal cannot but note however that Perenco should have better inspected and documented the conditions of the Blocks before signing the SPA and its schedules. It is due to its neglect that the schedules do not provide an exhaustive and definitive statement of the Blocks' condition in 2002.

806. The 1998 Grizzle-Sahr report neatly illustrates the challenge facing the Tribunal in differentiating between contamination in the Blocks which is plainly legally irrelevant and that which *might* be legally relevant to the present exercise. The 1998 report observed that there had been a release at Coca 6. But that release occurred in an area that is some distance away from the area at Coca 6 that is included in Mr. MacDonald's conceptual remedial plan and hence no question of Perenco's liability arises.[969] However, the Grizzle-Sahr report also identified three sites where reported releases might have contributed to contamination in areas which the Independent Expert identified as warranting remediation. Given the annual inspections and recommendation made therein, and Grizzle and Sahr's noting that some progress had been made in dealing with matters identified in previous reports, it is possible that Kerr-McGee took steps to remediate these incidents prior to its selling its interests in the Blocks to Perenco, but there is insufficient evidence on the record for the Tribunal to be satisfied on this point. The Tribunal therefore proceeds on the basis that some of the contamination at the following three sites predated Perenco's operatorship:

> – Coca 2/CPF - Oil releases from the API separator that discharged to the swampy area to the southeast of the facility.
>
> – Payamino 1/CPF - The presence of historical facility pits with several thousand barrels of crude to the west of the CPF, which could have potentially overflown to the north, towards the catchment area and the swampy area to the north/northwest of the facility.

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969 CE-CC-21; Appendix K of GSI ER I; Ecuador's Closing Submissions, p. 2.

> – Payamino 23 – Spills were observed behind the power oil system and at the north entrance and an open reserve pit was still in place to the south of the power oil facility.[970]

807. This shows the potential for the layering of contamination by different operators. This situation militates in favour of allocating responsibility based on the length of tenure or based on some other weighting factor.

808. In the end, the Tribunal is satisfied that the contemporaneous documentary evidence indicates that there was contamination caused by operators in the Blocks in the decades preceding the period of Perenco's operatorship. The visual inspections recorded in the various reports just quoted identified a variety of different shortcomings and in some instances Grizzle and Sahr gave "poor housekeeping" marks for various wells.[971] It is sufficient for the Tribunal to know that there were extensive drilling operations in the Coca-Payamino field and other parts of Block 7 and a few wells were drilled in Block 21 before Perenco arrived and that there is contemporaneous documentary evidence showing that at

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970 In respect of the first two of these sites, the Tribunal considers that the substantial majority of the contamination found by the Expert was caused by Perenco's predecessors.

971 Following a May 1994 audit, Grizzle and Sahr concluded that the following sites suffered from poor housekeeping which "infers inferior operating procedures reflected by obvious debris, minimal or no maintenance of equipment and buildings, numerous operational spills, and inadequate vegetation and erosion control" (p. 12) (only those sites delineated by Mr. MacDonald are listed here): Payamino 4, Payamino 10, Payamino 13, Payamino 15, Payamino 16, Payamino and Coca CPF (but the report says that the level of contamination was minor, see p. 44), and Coca 8. See E-261.

Following a 11-14 March 1996 inspection, Grizzle and Sahr noted that the poor housekeeping at Payamino 10 had been corrected (p. 9) whereas this still persisted at Payamino 16 (p. 11). Their report also noted that Jaguar 7's sewage system was "extremely poor" and there were poor storage practices (p. 6). More generally, the report considered that the practice of discharging of sewage into a stream had to be reconsidered, not just for Mono 3, but as a whole, in order to protect the health of people on location and those living along the streams (p. 6). See E-262.

The copy of Grizzle and Sahr's 6-9 June 1997 report provided to the Tribunal appears to have been truncated and does not discuss specific sites. See E-263.

After the 22-23 June 1998 internal environmental audit, Grizzle and Sahr did not refer to housekeeping conditions, but instead noted the various issues and steps required with respect to various sites. Generally, the following sites were noted as requiring or still requiring remediation (mostly affected soil): Lobo 1 facility, Jaguar 2, Jaguar 3, Jaguar 7, Mono 1, Mono 5, Gacela 1/8, Gacela 2, Gacela 4, Gacela 5, Gacela CPF (once again, only those sites delineated by Mr. MacDonald have been set out here).

that time there was a relative laxity when it came to conducting drilling operations and other oilfield activities in an environmentally-protective manner.

809. Perenco has also directed the Tribunal to other evidence of spills prior to its assumption of the operatorship of the two Blocks. The Tribunal accepts Perenco's contention that certain contaminants, in particular, barium (with or without other metals (*i.e.* cadmium, chromium, lead, nickel and/or vanadium)), should be taken to be associated with the installation of production wells. Given the documentary evidence showing substantial drilling of such wells prior to 2002, it follows that barium exceedances at those sites have been shown by Perenco, on a preponderance of evidence, to have resulted from the actions of its predecessors. Given the location of those wells, together with the mud pits constructed and used by Perenco's predecessors, and the Tribunal has been able to exclude liability, either wholly or partially, for different parts of the various sites investigated.

810. The Tribunal recognises that in attempting to "unscramble the contamination egg", it is dealing with knowns and unknowns.[972] Notwithstanding the work conducted by the Parties' experts and supplemented by the Tribunal's Independent Expert, this exercise is not one of scientific certainty. But, as noted above at paragraph 69, the estimation of damages is not a science and a court or tribunal must work with the evidence before it.

811. To be clear: before using a time-based weighting system in respect to a particular site, areas within the site that could be clearly designated as "non-Perenco" or "Perenco" were segregated and placed in the corresponding "bucket" of responsibility. In addition, where other criteria could be used, these were applied in lieu of the time-weighted approach. But sometimes it has been necessary to allocate responsibility between successive operators. So far as prior operators are concerned, the time of first well drilling at a specific site is used as the starting point and July 2009, when Perenco ceased operations in the Blocks, is used as the end date (with the exception of sites where the 'Petroamazonas temporal issue'

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[972] As the Expert's Direct Presentation made clear, at Slide 18, data gaps can exist even after multiple sampling events and therefore inferences are typically applied to complement analytical results.

applies).[973] This tends to bias in favour of Perenco, and therefore is a conservative estimate of its responsibility, because it does not consider the possibility of later contaminant release dates and the fact that some fields were drilled but not heavily exploited until Perenco arrived (*i.e.*, Oso and Yuralpa).[974] As for any allocation as between Perenco and Petroamazonas, to the limited extent that it is used (for the reasons previously given), the time-weighted system uses July 2019 as the end date. This is relevant only for a few sites for groundwater (Coca 2/CPF, Gacela 1/CPF and Payamino 1/CPF) and therefore assumes much less importance than the system used for Perenco and prior operators.

3. Did the Independent Expert act within his mandate?

812. Turning to the second set of issues, virtually all of them are bound up with the exercise of technical judgement and expertise. Nevertheless, the Tribunal considers that the following questions pertaining to the Independent Expert's mandate should be addressed.

813. Specifically, did the Independent Expert:

> Adhere to the Tribunal's restrictions on site sampling?
>
> Follow the Tribunal's instructions on establishing the land-use criteria?
>
> Exceed his mandate with respect to mud pits by resolving to apply RAOHE Table 7(a) to all mud pits?
>
> Exceed his mandate with respect to groundwater monitoring by resolving to apply TULAS to groundwater samples taken from wells installed in sites where the clay content exceeded 25%?

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973 See paragraph 785 above.

974 Consolidated Expert Report, pp. 24-25: "The first petroleum exploration activities within Block 7 and the CPUF reportedly occurred in the early 1970s, when Texaco drilled exploratory oil wells at the Coca 1, Cóndor 1, and Zorro 1 platforms. British Petroleum (BP) also constructed an exploratory well at Oso 1 in 1970. Oil extraction activities do not appear to have occurred until approximately December 1985 when BP began developing the area under a service contract…" As for Block 21, "Texaco began oil exploration activities in Block 21 during the early 1970s at the Yuralpa 1 platform. Further activities were not conducted within the Block until March 1995, when Oryx conducted further exploratory environmental impact and seismic studies. When Perenco began operating at Block 21 in 2002, it contained a small number of wells (approximately nine) and Central Processing Facilities (CPFs). Upon the July 2009 takeover of the operations, operations within Block 21 had increased substantially."

> Adhere to the Tribunal's instruction that when estimating costs of any remediation for which Perenco is liable, the Expert shall be guided by Ecuadorian costs?[975]

(a) The Independent Expert's sampling mandate

814. The Tribunal recalls that Mr. MacDonald was instructed to review the work performed by the Parties' experts and to sample at those sites where either or both of the Parties' experts had found evidence of contamination. The Tribunal reasoned that:

> "590. … IEMS and GSI had ample opportunity to take samples in whatever parts of the Blocks either considered necessary. The Tribunal's expert will therefore confine his/her work to the specific sites at which soil samples were taken and groundwater sampling wells were drilled. Although, due to the differences between IEMS and GSI's sampling practices, it will be necessary for the expert to re-sample at those sites where contamination was detected by one or the other party's experts and to delineate the extent of any such contamination, the Tribunal's expert will not sample other sites that the Parties' experts did not sample.[976]
> ...
> 592. … the Tribunal wishes to make clear that this course of action is not intended to provide any opportunity for the Parties to provide new evidence (except that called for by the Tribunal in aid of its expert). They have had ample opportunity to present their cases. The purpose of the next phase is for the Tribunal's expert to validate one approach or the other in respect of the remaining technical issues."[977]

815. In addition, the Tribunal observed:

> "596. It need hardly be said that every attempt must be made to base the determination of damages owed on the situation existing at the time of the Consortium's departure in July 2009."[978]

816. Mr. MacDonald was thus instructed not to perform a *de novo* study of the environmental condition of the two Blocks. The Tribunal recognised that this instruction meant that there would almost certainly be contamination in the two Blocks which was not captured either by the Parties' experts or by the Tribunal's Independent Expert:

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975 Such issues as the interpretation of chromatograms, calculation of background values and 'order of magnitude' issues are considered to fall within his sphere of expertise and competence.

976 Interim Decision on Counterclaim, paragraph 590.

977 *Ibid.*, paragraph 592.

978 *Ibid.*, paragraph 596.

> "595. The Tribunal is mindful that it is almost certain that the sampling performed by both experts did not adequately capture all of the contamination. Indeed, notwithstanding its initial declaration that its intention was to "achieve a comprehensive assessment of current environmental conditions for each of the 74 oilfield facilities investigated by IEMS in the CPUF, Block 7, and Block 21 area", this is not what GSI did. As Ecuador pointed out, GSI accepted that it confined its investigation to seeking to invalidate RECs identified by IEMS. Mr. Connor further confirmed that GSI did not attempt to comprehensively estimate the amount of contamination in the Blocks, separately from its review of IEMS' work, and acknowledged that both experts could have missed instances of contamination. Be this as it may, the present exercise is concerned with an accurate and impartial analysis of the work that was done by the experts – who had ample opportunity to examine the Blocks. Their work must now be evaluated by the expert in accordance with the Tribunal's findings."[979] [Emphasis added.]

817. Two other points warrant mention. First, as noted above, Mr. MacDonald was instructed not to consider the allocation of responsibility to Perenco for its share of the contamination which he determined to exist in the relevant sites. Secondly, he was also instructed to perform his work without regard to the determinations made by the *Burlington* tribunal.[980]

(b) Did the Expert exceed his mandate in conducting sampling at sites that were not sampled by either of the Parties' experts?

818. Perenco complained that certain sites which the Expert decided to sample had not been found to be contaminated by either of the Parties' experts. The Expert moreover assumed that certain mud pits contained exceedances without his having sampled them.[981] Perenco therefore submitted that the Tribunal must exclude these sites (pits at Oso 9A, Oso 9 B, Oso 9, Pits 2, 4, Yuralpa SL pit, and Yuralpa G, pit 2[982]) from the total measured contamination in Blocks 7 and 21.[983]

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979 *Id.*

980 Expert's Direct Presentation, Slide 3.

981 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraphs 56-57.

982 Perenco's Closing Presentation, Slide 21.

983 By "total measurable contamination" the Tribunal refers to the Expert's estimation of the total contamination in those areas of the Blocks which were previously identified by one or the other of the Parties' experts and then sampled and further delineated by the Expert. Due to the Expert's restricted mandate, this is not to be taken as a firm estimate of all of the potential contamination in the two Blocks.

819. During his opening presentation to the Parties and the Tribunal on 11 March 2019, at which he reviewed his work and responded to the Parties' written comments, Mr. MacDonald began by summarising the "mandates that guided the scope of work."[984] The first two points on his slide stated:

> "Investigation of soil and groundwater was restricted to areas already sampled by the Parties.
>
> Investigation of mud pits was limited to those known to have been used by Perenco."[985]

820. Mr. MacDonald thus differentiated between sampling of soils and groundwater, on the one hand, and sampling of mud pits, on the other. Having regard to the Interim Decision on Counterclaim as a whole, the Tribunal considers that this was a not unreasonable interpretation of the Tribunal's directions. With respect to the first point on Mr. MacDonald's slide, at paragraph 590 of the Interim Decision, the Tribunal stated: "The Tribunal's expert will therefore confine his/her work to the specific sites at which soil samples were taken and groundwater sampling wells were drilled…."[986]

821. With respect to mud pits, the Interim Decision on Counterclaim was clear in expressing the Tribunal's intention that Perenco would be liable for any exceedances found in mud pits that Perenco had used. When the general instructions were developed in the Interim Decision on Counterclaim (assuming an expert might have to be appointed), it appeared to the Tribunal that the principal difference between the Parties in respect of mud pits was not the *number* of mud pits that Perenco had used, but rather of that universe of pits, *how many were lined as opposed to unlined*? This can be seen in the discussion in paragraph 502 of the Interim Decision on Counterclaim:

> "502. The Schedule of Closed Mud Pits attached as Appendix A to the Claimant's Post-Hearing Brief on Counterclaims, which was prepared with both Parties' involvement and for which the Tribunal is grateful, regrettably shows that there are substantial disagreements as to whether

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984 Expert's Direct Presentation, 11 March 2019, p. 1.

985 Tr. (1) (MacDonald) (11 March 2019) 20.

986 Interim Decision on Counterclaim, paragraph 590.

> many pits were lined or unlined. The 'Master List' records disagreement in at least 26 of 79 cases; the 'Pits Constructed by Perenco' list shows an even higher percentage of disagreement (14 of 18). The 'Pits Constructed by Prior Operators' shows 12 disagreements (of 63 entries) and many (36) unknowns."[987] [Emphasis added.]

822. To be clear, Perenco did *not* complain that the Independent Expert sampled mud pits that had been used by other operators.[988] Perenco did not take issue with the Consolidated Independent Expert Report's statement that:

> "Per the Tribunal, the condition of non-Perenco pits, either those constructed before September 2002 or after July 2009, were not relevant to the claim and were excluded from Ramboll's assessment."[989]

823. The Consolidated Independent Expert Report moreover explicitly notes that Mr. MacDonald limited his sampling to the pits that the Parties' representatives *agreed* had been used by Perenco.[990] Perenco's grievance is that the Independent Expert either sampled mud pits admittedly used by Perenco but which had not been previously sampled by the Parties' experts[991] or that he did not sample certain pits used by Perenco, but rather only inferred contamination of such pits.[992]

824. It was not the Tribunal's intention that Perenco would be able to avoid liability for any exceedances determined by the Independent Expert for mud pits which Perenco had used. From the Tribunal's perspective, the key objectives insofar as mud pits were concerned

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987 *Ibid.*, paragraph 502.

988 The Notes to Table 5.1 indicate instances where mud pits were identified as being associated with non-Perenco operations and therefore were not sampled. See notes 4 and 5.

989 Consolidated Expert Report, "Mud pits" p. 237, second bullet.

990 *Ibid.*, Section 7.1. "Mud Pits", second paragraph: "Per the Tribunal, the condition of non-Perenco pits, either those constructed before September 2002 or after July 2009, were not relevant to the claim and were excluded from Ramboll's assessment. The mud pits considered in our work were therefore limited to those that the Parties agreed were associated with prior Perenco operations. All of the Perenco mud pit areas were inspected, and almost all were sampled. …"

991 *Ibid.*, p. 93: "At Oso 9A and 9B, however, Ramboll designates for remediation 7 mud pits even though neither IEMS nor GSI found evidence of exceedances in these sites. Consequently, these areas were beyond the scope of Ramboll's investigation."

992 *Ibid.*, pp. 93-94: "…Ramboll's own sampling disproves the assumption that adjacent pits have similar contents: Ramboll found that pit 8 in Oso 9 met the performance criteria even though the adjacent pit 9 did not."

were twofold: (i) to have Mr. MacDonald 'get to the bottom' of the lined/unlined pit dispute between the Parties; and (ii) to ensure that Perenco would *not* be held liable for pits constructed by prior operators which it did not use. This was made clear at 604 of the Interim Decision on Counterclaim:

> "604. The same exercise must be performed in relation to the mud pits used by Perenco up to 16 July 2009. Perenco cannot be held liable for pits constructed by prior operators which it itself did not use, because by definition it would be able to show that any damage caused from leachates escaping from such pits cannot be attributed to it. It can only be held liable for damage resulting from the pits which it used or built. It is necessary to ascertain whether the drilling muds were disposed of in a properly constructed sealed pit or disposed of in an unsealed pit or one that was improperly constructed and which therefore may be more susceptible to leaching."[993] [Emphasis added.]

825. As part of his planning process, Mr. MacDonald provided a list of mud pits to the Parties for their comment.[994] Included on that list were Oso 9A and Oso 9B.[995] (Perenco's use of both of these sites had been noted in GSI's 2012 expert report.[996]) As for the Yuralpa sanitary landfill pit and Yuralpa G, pit 2, the history of Block 21's development is clear: As reflected in GSI's list of wells drilled in Yuralpa, with the exception of three wells drilled by Texaco (Yuralpa 1) and Oryx (Yuralpa Centro 1 and 2), the Yuralpa field was developed by Perenco.[997] As for Oso 9, pits 2, 4, these pits were not sampled by Mr. MacDonald, but they were situated within a large mud pit area and the pits surrounding these two (pits 1, 3, and 6[998]) were sampled. All of those sampled pits showed regulatory exceedances. The estimation of contamination at these two pits resulted from Mr.

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993 Interim Decision on Counterclaim, paragraph 604.

994 This correspondence was supplemented by discussions with Party representatives. Mr. MacDonald commented: "… I think the pit – I'll call it the "Pit mandate" – was through available information and attempts, very strong attempts, to affirm with the Parties that no one had an objection." Tr. (1) (MacDonald) (11 March 2019) 132:16-19.

995 During the Expert Hearing, Mr. MacDonald noted that he had sent an email or a letter regarding the sampling of Oso 9A and 9B. "It was clear to us from representations made in the field that those areas received mud pit materials from Perenco." Tr. (1) (MacDonald) (11 March 2019) 130:15-17.

996 GSI ER I, Appendix L.54 "Compilation of Site-Specific Information for Oso 09, 12, 15, 16, 17, 18, 19 and 20 Well Platform, Block 7", pp. 4 & 9.

997 GSI took samples / see Tr. (1) (MacDonald) (11 March 2019) 132.

998 GSI ER II Appendix B.4, Well List, p. 4.

MacDonald's drawing an inference from the regulatory exceedances which he had confirmed at the surrounding pits.[999]

826. The Tribunal understood from its mandate discussions with the Independent Expert at the outset of his work that he considered sampling roughly half of Perenco's pits and inferring from the results of that sampling estimates of contamination in the balance of the pits. In the end, Mr. MacDonald did far more sampling than inferring:

> "The mud pits considered in our work were therefore limited to those that the Parties agreed were associated with prior Perenco operations. All of the Perenco mud pit areas were inspected, and almost all were sampled."[1000] [Emphasis added.]

827. Given what the Tribunal stipulated in the Interim Decision on Counterclaim, specifically its stated intention to have all mud pits used by Perenco assessed, the Tribunal does not consider that Mr. MacDonald's reasons for deciding to sample or assign responsibility by means of the limited use of inference to the mud pits listed above at paragraph 818 to be unreasonable. It holds therefore that he did not step outside of his mandate.

(c) Did the Expert exceed his mandate in not conducting sampling at sites that were sampled by either of the Parties' experts?

828. While Perenco raised many objections that would, if accepted, have significantly narrowed the scope of contamination found by the Expert, Ecuador raised a different set of issues focusing on Mr. MacDonald's inability or failure, as the case may be, to sample certain sites which were sampled by one or the other of the Parties' experts.

829. Ecuador pointed out that the Expert did not sample every site where contamination was found by one or the other of the Parties' experts. For example, IEMS investigated the groundwater situation at the Yuralpa landfill ("Yuralpa LF"), but Ramboll was not able to

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999 Independent Expert Report, Table 5.1: "Mud Pits 2 and 4 at Oso 9 are associated with Perenco but were not investigated by Ramboll or the Parties. The contents of these two mud pits are likely of similar quality as that found in neighbouring Mud Pit 1 and Mud Pits 3 and 5, respectively."

1000 *Id.*, Section 7.1.

sample this site due to logistical difficulties.[1001] Ecuador argued that since at least one well at every site has a detected exceedance of TPH and/or barium, it would be reasonable to assume that the groundwater at Yuralpa LF would be equally affected.[1002] Ecuador noted further that Perenco also installed wells at Yuralpa B and used mud pits at that site. Due to an oversight, Ramboll did not investigate the Perenco mud pits at that site.[1003] Given that Mr. MacDonald found that 87% of the mud pits constructed or used by Perenco did not conform to the performance criteria of RAOHE, Ecuador argued that it was reasonable to assume that the mud pits at this site would also not have met the standards prescribed by RAOHE.[1004] Finally, during the Expert Hearing, Ecuador referred to evidence that Perenco had disposed of mud pit materials generated at other sites at Payamino 16.[1005] Again, considering that 85% of the Perenco mud pits did not conform to RAOHE's performance criteria, Ecuador argued that it is reasonable to assume that the mud pits at this site would also not have conformed to RAOHE.[1006]

830. The Tribunal has given due consideration to this concern and believes that it is fair, in view of the above circumstances, to adjust upward by US$7.7 million the damages estimated by Mr. MacDonald and found by the Tribunal to be allocable to Perenco.

831. A related issue is Ecuador's attempt to have the Tribunal increase the damages because of the fact that Perenco performed certain workovers of production wells that had been drilled by its predecessors. Ecuador contended that just as the initial drilling of the production wells would have generated wastes, so too would the workovers. In the period leading up to the Expert Hearing, the Tribunal agreed with Ecuador's request that Perenco produce its workover reports.[1007]

1001 Independent Expert Report, Section 4.2.4.

1002 Consolidated Expert Report, p. 239, paragraph 7.

1003 Tr. (1) (MacDonald) (11 March 2019) 30:12-22.

1004 Tr. (2) (MacDonald) (12 March 2019) 395:2-10.

1005 *Burlington* Decision on Counterclaims.

1006 Tr. (2) (MacDonald) (12 March 2019) 397:8-18.

1007 Ecuador's request was set out in its letter of 22 January 2019, p. 2; this request was granted by the Tribunal in its letter dated 8 February 2019.

832. This issue was raised relatively late in the proceedings. Perenco objected to this on the grounds that even though seven years ago Perenco produced some evidence about workovers that it had performed, Ecuador was now seeking to expand the record on that historical point, while continuing to withhold the same kind of information about its own operations that actually was relevant to the Tribunal's decision at this stage, *i.e.* records of Petroamazonas' post-July 2009 records of workovers that it had been ordered to produce.[1008] (The Tribunal has already expressed its disagreement with Perenco's characterisation of Ecuador's alleged failure to comply with Procedural Order No. 17.)

833. In the end, the Independent Expert agreed with Perenco that the issue had been raised relatively recently and that the workover reports that he had received early on in his work were relatively few in quantity. It was only in the last phase of the counterclaim proceeding that he was given more documentation relating to workovers.[1009] From his review of the documentation, although Mr. MacDonald agreed with counsel for Ecuador that workovers typically would generate residues[1010], based on the information before him (which indicated the use of drilling fluids, but not what chemical additives were used, nor whether barium sulphate was used), he was unable reasonably to estimate Perenco's potential contribution at sites where workovers were performed.

834. This is an exercise of technical judgement and the Tribunal declines to second-guess the Independent Expert on this determination. Ecuador's workover claim is therefore rejected.

(d) The land-use debate

835. During his visits to the Blocks, Mr. MacDonald examined the Napo River Basin and the dominant features of the Blocks which he then briefly described in his Report:

> "… I observed that local topographic conditions of the platforms varied significantly, with some located in hilly regions steep-sloped gullies, others within swampy lowlands, and still others within agricultural settings. Almost all sites, however, were surrounded by rainforest of

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1008 Perenco's letter to the Tribunal dated 5 February 2019.

1009 Tr. (2) (MacDonald) (12 March 2019) 307.

1010 Tr. (1) (MacDonald) (11 March 2019) 133:8-137:21; Tr. (2) (MacDonald) (12 March 2019) 310:15-315:14.

> varying ecological value (e.g., primary and secondary forests; forests with evidence of concurrent agricultural use). As described further… while some portions of this forest are designated as having special significance, this entire rainforest ecosystem is considered to be environmentally sensitive and to have intrinsic value, regardless of whether it is pristine."[1011]

836. Both Parties objected to certain land-use designations employed by the Independent Expert. Leaving aside a few other objections to his designations, the main issue of dispute between the Parties on this aspect of the Report was that Ecuador considered that certain sites that the Independent Expert designated as "agricultural" should have been designated as "sensitive ecosystem" and that that two water bodies should have been classified as sensitive ecosystem areas rather than agricultural.[1012] Perenco considered that certain sites that the Independent Expert designated as "sensitive ecosystem" should have been considered "agricultural." It is not necessary to repeat the objections in detail; they are set out above at paragraph 670 *et seq* above.

837. The approach to be taken by the Independent Expert was set out in the Interim Decision on Counterclaim at paragraph 495, under the heading: "Conclusion on land-use criteria":

> "491. … the Tribunal considers that the treatment of this issue should be guided by the Ecuadorian authorities' practice in relation to the Blocks. The evidence shows that the authorities accepted the application of industrial land-use criteria in certain parts of Blocks 7 and 21, in particular, in the January 2003 Remediation Plan relating to the Payamino Sanitary Landfill, Payamino 22, Payamino CPF, Coca CPF and Jaguar CPF as approved by the Ministry, the report of a clean-up of a spill at Payamino 19 in June 2009, the Consortium's EIS for the construction of the Oso A and Oso B platforms and the Yuralpa Norte platform in April and October 2006, and, most significantly, in the environmental impact studies commissioned by Ecuador in 2010.
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> 492. Ecuadorian authorities similarly accepted the application of agricultural land-use criteria in areas surrounding platforms in Blocks 7 and 21 such as in the Ministry-approved remediation plan for the May 2007 spill from the Oso 2 flow line, the January 2008 Ministry-approved remediation plan for a spill in the Gacela-Payamino flow line in October 2007, and in the environmental impact studies commissioned by Ecuador in 2010. In the present proceeding, IEMS itself accepted that the areas

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1011 Consolidated Expert Report, p. 24.

1012 *Ibid.*, p. 10. Ecuador also argued that the Expert failed to fully capture the extent of contamination in the tested areas.

> surrounding Coca 6, Coca 8, Lobo 3, Lobo 1, Oso 9, Mono CPF, and Payamino CPF were primarily used for agricultural purposes.
>
> 493. This is not to say that, once selected, the land-use criteria are irrevocable and the decision cannot be changed. However, there is significant probative value to be derived from the authorities' acceptance of a particular land-use criterion with respect to the same area for the purpose of measuring soil remediation.
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> 494. It is also clear to the Tribunal that the sensitive ecosystem designation is not limited to designated protected zones. RAOHE makes clear that the designation applies in areas "such as the National Heritage of Natural Areas *and others* identified in the corresponding Environmental Study." GSI's initial approach was to restrict the use of the sensitive ecosystem criterion to those areas alone. The Tribunal notes that GSI itself accepted that the "sensitive ecosystems criteria" might apply to a number of sites in the Blocks which intersected with State-designated sensitive ecosystem areas: Payamino CPF, Payamino 1, Payamino 2-8, Payamino 19, Waponi-Ocatoe and Nemoca".
>
> **(3.1) Conclusion on land-use criteria**
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> 495. The Tribunal concludes that that in view of the 2008 Constitution's imperative in favour of the protection of the environment, in any case of doubt where a site could be considered to fall under either of two designations, the more stringent land-use designation should be applied. In the Tribunal's view, where a posterior land use has not been designated, Article 395.4 of the 2008 Constitution's focus on full restoration should guide in determining the appropriate land use and it should be in favour of the most environmentally-protective designation that is reasonable in the circumstances of the particular case. At the same time, the prior determinations of the Ecuadorian authorities have significant probative value."[1013] [Emphasis added.]

838. This was repeated in a summary form in the Tribunal's Interim Decision on Counterclaim at paragraph 611(15):

> "In any case of doubt as to the applicable land-use criteria, subject to prior determinations of Ecuadorian authorities which have significant probative value, the more stringent land-use designation applies."[1014]

[1013] Interim Decision on Counterclaim, paragraphs 491-495 [fn. references omitted.]

[1014] *Ibid.*, paragraph 611(15).

839. In these instructions, the Tribunal wished to give the Independent Expert a degree of latitude to determine what was appropriate in the circumstances of a specific case. If the Ecuadorian authorities had previously made certain land-use determinations, those were to be given "significant probative value", but the Tribunal did not intend by this indication to hold that any such prior determinations would be dispositive of the question in specific cases and that the Independent Expert could not use his own judgement given the specific characteristics of a particular site. (Otherwise, the Tribunal would have used words to the effect that "the Ecuadorian authorities' prior land-use determinations shall govern".)

840. It is important to recall that having sampled the sites, the Independent Expert was then to delineate the extent of contamination (because IEMS' mapping methodology had been rejected and because the Tribunal had doubts about GSI's delineations). Thus, the issue of land-use criteria would arise only once Ramboll had identified the location and type of contamination and delineated its extent. Many of the determinations were not black and white; Mr. MacDonald noted, for example, that TULAS defined agricultural land as including lands that "maintain a habitat for permanent and transient species, in addition to native flora."[1015] Thus, reasonable people can differ as to when or whether a particular site that exhibited agricultural characteristics could also have a part thereof which could be considered to be sensitive ecosystem. In the Interim Decision on Counterclaim, the Tribunal recognised that there could be cases of doubt where a site could be considered to fall under either of two designations and directed that in such circumstances, the more stringent designation should be applied. The intention was that the Independent Expert should bear in mind how a particular site had been treated by the authorities in the past, but if for some reason he considered that a more stringent land-use designation should apply, he could so determine. At the same time, however, the Independent Expert was not obliged to default to the sensitive ecosystem designation as Ecuador's submissions seemed to imply. Thus, in some instances, Mr. MacDonald adopted a land-use classification which was favourable to Perenco's position (which Ecuador considered to be insufficiently

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[1015] TULAS Book VI, Annex 2, §2.50, cited at Expert's Direct Presentation, Slide 8.

stringent), and in other instances he adopted a classification which was favourable to Ecuador's position (and contested by Perenco as being unduly stringent).[1016]

841. Mr. MacDonald and his team surveyed the situation in the two Blocks, studied the record of this counterclaim, including prior filings with the Ecuadorian authorities, and consulted Ministry of Agriculture maps. After conducting the sampling activities, they plotted the delineated areas of contamination on some 51 sites (using aerial photographs). The Tribunal considers that it is not in a better position to make these site-by-site land-use determinations and therefore declines to interfere with them.

(e) Mud pits

842. The issue of mud pits is more of a technical issue than a mandate issue, but in view of the amount of time spent on the issue during the course of this counterclaim, the Tribunal deems it appropriate to discuss the Independent Expert's decision to apply RAOHE Table 7(a) to all of Perenco's mud pits.

843. The Tribunal has already adverted to the "lined/unlined mud pit" controversy. Perenco's historical practice with respect to mud pits was not well-documented. Earlier in this arbitration, after being ordered to produce documents pertaining to the design and construction of mud pits, Perenco stated that it: "…does not have a specific written policy for the construction, cleaning, monitoring, testing, and closing of pits."[1017] Perenco relied primarily on Mr. Saltos' testimony and a note of interviews of former employees of Perenco prepared by IEMS as well as some photographic evidence to show that liners were used in some pits. However, the Tribunal was also mindful of a statement made by a former Perenco employee to the effect that even when such liners were laid down, the wastes were not deposited properly.[1018] For this reason, the Tribunal found that the evidence "was mixed and not fully supportive of Perenco's position because one former employee stated that

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1016 In his presentation on Day 2 of the Expert Hearing, Mr. MacDonald reacted to both Party's critiques of his designations (dealing with Ecuador's criticism at Slides 7-11 and Perenco's at Slides 39-46.)

1017 Interim Decision on Counterclaim, paragraph 501, quoting Perenco's response to Request #12, 18 January 2013.

1018 *Ibid.*, paragraph 501.

undue care was taken in depositing drilling muds such that the liners cracked under the high temperatures."[1019] This raised the possibility that even if Perenco lined some pits, the way in which it prepared the pits, mixed the muds, or deposited them in the pits could damage any liners that might have been laid down.

844. Moreover, earlier in the Counterclaim proceeding, Perenco's experts treated all of Perenco's mud pits as if they had been "sealed" (essentially equating mud pits with no impermeable liner laid down prior to depositing the mud, but which were said to be lined with clay, with pits with impermeable liners). The Tribunal disapproved of this approach:

> There also appears to be a disagreement on whether a pit which might have been built in clay soil is to be considered to be "sealed"; GSI's Mr. Connor believed so, while IEMS did not. The Tribunal is not prepared to equate what have been assumed to be impermeable clay-based pits with those that have been lined within an impermeable synthetic barrier. This would first require the Tribunal to assume that the bottom of an unlined pit was in fact clay. IEMS adduced evidence that this was not necessarily the case; in some instances sandy soil is located near the pits. During cross-examination, Mr. Connor admitted that, for example, when looking at a Coca 8 pit, GSI did not do any geotechnical testing and assumed that the bottom of the pit was lined with clay.[1020]

845. The existence of liners capable of acting as an impermeable barrier between the muds and the surrounding soil (and potentially groundwater) is of pivotal importance because RAOHE prescribes two different standards in its Table 7. A stricter standard for the treatment of the muds is applied to unlined pits than that applied to pits which have been lined with an impermeable barrier.

846. Thus, the Independent Expert was instructed to satisfy himself as to the state of the mud pits that Perenco used or constructed. The Tribunal advised that "if a pit has an impermeable liner, Table 7(b) applies. If there is no impermeable liner, Table 7(a) applies. In any case of doubt, the more environmentally protective standard in Table 7(a) applies."[1021]

1019 *Id.*

1020 *Ibid.*, paragraph 503.

1021 *Ibid.*, paragraph 611 (16).

847. Mr. MacDonald and his team examined the mud pits that had been used by Perenco. Among other things, the mud pits were "visually inspected to assess the physical integrity of the mud pits, identify the presence of any distinct soil cover layer, and determine whether there was evidence of any synthetic mud pit liner material."[1022] At footnote 180 of his Report, the Independent Expert commented:

> "The Parties have not provided any direct evidence as to whether liners are present for any specific mud pit. As part of Ramboll's investigation, borings were designed to terminate above the suspected bottom of the mud pit to avoid puncturing any potential liners (if present) and creating a vertical migration pathway for contamination. Photographs taken by Perenco at the time of closure of some mud pits show that an excavator was typically used to treat the mud pit material in place, which likely would have resulted in the tearing or ripping of any liner material that might have been present. Therefore, Ramboll has conservatively assumed that none of the pits are lined or that any liner is likely not intact."[1023] [Emphasis added.]

848. He restated this finding in the comments following Table 5.1, the summary table on mud pits findings:

> "No information was provided sufficient to confirm that synthetic or clay liners are present beneath any specific mud pit. It should be clarified that Ramboll did not drill through the bottom of the mud pits to determine the presence or absence of liner material, since this would have compromised the units if the liners were present. In some cases, Ramboll did observe torn liner material along some mud pit perimeters, but had no information regarding its condition or lateral extent in the rest of the mud pit. Therefore, without exception, the leachability testing data was conservatively compared to the standards for unlined mud pits presented in RAOHE Table 7a."[1024] [Emphasis added.]

849. Thus, in the end, Mr. MacDonald was not persuaded that there was sufficient evidence of competent impermeable liners (*i.e.*, liners that, if actually installed prior to disposing of muds, had maintained their integrity) such as to justify applying the less strict standard

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1022 Consolidated Expert Report, Section 5.2.1.

1023 *Ibid.*, fn. 142.

1024 Independent Expert Report, first bullet after Table 5.1.

expressed in RAOHE Table 7(b).[1025] In his Opening Direct Presentation at the Expert Hearing, Mr. MacDonald stated that like GSI, Ramboll also observed portions of liner material on the ground surface around some mud pits, but such material "was observed in only at 8 of the 38 inspected Perenco mud pits (21%), with geogrid observed near the surface of the pits in an additional three mud pits (likely as part of the cover material)."[1026] The closure reports and photographic evidence to which Perenco referred Mr. MacDonald during the Expert Hearing raised questions in his mind. He testified that in two of the three pit closure reports that he had been able to review, even though it appeared that plastic liners had been laid down, Perenco itself had tested the pit contents against the more stringent Table 7(a) of RAOHE rather than the standard applicable to lined pits.[1027] He noted further that the photos showed that an excavator was operating within the pit (in order to mix the mud) and opined that this would imperil the integrity of any liner. He observed further that there were gouging markings on the side of the pits which indicated that the excavator was using a bucket with teeth which could cause damage to any liner that had been laid down.[1028]

850. Notwithstanding Perenco's cross-examination of Mr. MacDonald on the point, given the absence of a written protocol and detailed pit closure reports, as well as the limited photographic evidence of closure practices, together with the Expert and his team's inspection of the sites, the Tribunal considers that Mr. MacDonald was entitled to determine that the more stringent standards should be applied. The Tribunal recalls in this regard its prior instruction that: "In any case of doubt, the more environmentally protective

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1025 During the Expert Hearing, Mr. MacDonald testified: "We only had three mud pit closure reports; Coca 19, Jaguar 9, and Yuralpa landfill. That we looked at. They have pictures. They have some description, they are in Spanish, but I can read Spanish. José reads it better than I do. And —but nonetheless, in no instance did the reports describe or show treatment of mud pit materials outside of the mud pits. They show the contrary. Two of the three sites, there is damage to the liners shown in the photos, and if two of the three sites the Contractor for Perenco compared the mud pit testing results, the performance criteria for unlined pits. Okay. So, there's no record and no evidence of competent liners that we've been provided with." Tr. (1) (MacDonald) (11 March 2019) 81:2-8.

1026 Expert's Direct Presentation, Slide 82.

1027 Expert's Direct Presentation, Slide 79; Tr. (1) (MacDonald) (11 March 2019) 81:2-8, 19-21.

1028 Expert's Direct Presentation, Slide 81; Tr. (1) (MacDonald) (11 March 2019) 81:22-82:6.

standard in Table 7(a) applies."[1029] Therefore, the Tribunal leaves the Expert's approach undisturbed.

(f) Groundwater sampling

851. The Independent Expert was instructed as follows:

> "On the matter of groundwater testing, the expert shall undertake groundwater sampling in accordance with the Tribunal's determination of the appropriate technical standard under Ecuadorian law and industry practice as set out in this Decision. Its sampling shall be confined to the sampling locations identified by IEMS and GSI. Given the effluxion of time, it might be necessary to allocate responsibility for remediation as between Perenco and Petroamazonas. The Tribunal will await the expert's report in this regard."[1030]

852. Between 13 November and 14 December 2017, Ramboll collected samples from 34 permanent monitoring wells installed at 12 sites. The samples were analysed for TPH and metals. The results of the laboratory testing are set out in Table 5.2 of the Report. In summary terms, the Expert found:

> "Based on Ramboll's sampling results, TPH contamination in groundwater above the TULAS standard is present in all 12 investigated sites, and in 74% of sampled monitoring wells. The maximum observed concentration of TPH was 1915 µg/L at Payamino 2/8, as compared to the TULAS criterion of 325 µg/L. Barium is found at 58% of the sites, and in 38% of the sampled wells. The maximum observed concentration of barium was 4700 µg/L at Gacela 1, as compared to the criterion of 338 µg/L. No other contaminants of concern were identified in the monitoring wells."[1031]

853. Ecuador had no substantial criticisms of the Independent Expert's work in this regard.[1032] There appears to be no suggestion by Perenco that Mr. MacDonald sampled at sites not

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1029 Interim Decision on Counterclaim, paragraph 611(16).

1030 *Ibid.*, paragraph 611(17).

1031 Consolidated Expert Report, third bullet after Table 5.2.

1032 *Ibid.*, p. 51: "As MacDonald correctly points out at Section 3.2.3 (at p. 43), RAOHE does not specify numerical cleanup standards for groundwater. He thus appropriately proceeded to compare the groundwater Maximum Permissible Limits from TULAS Book VI, Annex 1, Table 5 to the groundwater concentrations determined for barium, cadmium, chromium, copper, lead, nickel, zinc, and TPH. This is precisely what IEMS and GSI did as part of their investigations."

sampled by IEMS or GSI (although he did acknowledge that due to technical considerations, two wells [PAY01-MW03 and JAG02-MW-3] were advanced within areas of high levels of soil contamination).[1033]

854. However, Perenco took issue with Mr. MacDonald's application of TULAS' Table 5 groundwater criteria to soils with a clay content greater than 25%, "even though TULAS specifically excludes such soils from these criteria."[1034] Perenco argued that if a soil contained a clay content of greater than 25%, the regulation simply did not apply. During the Expert Hearing, counsel for Perenco cross-examined Mr. MacDonald on the point and during the expert witness conferencing session he also elicited testimony from GSI's Mr. Bianchi to this effect.[1035] Mr. MacDonald disagreed with Mr. Bianchi on this point.[1036]

855. The Tribunal sees both sides to this disputed point and the result is a closer call than for the preceding issues. It is odd that the table specifies a clay percentage at all and for that reason Perenco's argument is hardly implausible. But TULAS does not go on to state that if the clay content of the soil is greater than 25%, there is no need to investigate and/or remediate the groundwater for contaminants. In this sense, the Tribunal can see the logic of the position taken by the Independent Expert.

856. In the end, the Tribunal has decided to accept Mr. MacDonald's approach for the following two reasons.

1033 E-453.

1034 Consolidated Expert Report, p. 58.

1035 Tr. (1) (MacDonald) (11 March 2019) 269:3-12: "one thing that is very clear in Ecuador, and it's not that different in other countries in the region, when the regulations state something, you stick to that regulation. And if it says 25 percent clay —I don't know the word in English —"*fiscalizar*"— you can't be regulated when you're not falling within the regulation. It just doesn't apply. So, in the case when clay is greater than 25 percent, the regulation doesn't apply, and it says that. It applies when it's less than 25 percent." See also Perenco's Closing Presentation, Tr. (2) (MacDonald) (12 March 2019) 433-434.

1036 Tr. (1) (MacDonald) (11 March 2019) 269:13-270:4: "This is one we might just have to disagree about, which is okay. But, again, we were —I was not precluded from reading the regulations, interpreting then, nor of having conversations with other consultants in Ecuador, including environmental counsel where I was pushing and probing. It's no different than the TPH issue. It's very clear, for example, in RAOHE, that there is absolute freedom to suggest alternative analysis under those regulations, and I interpret TULAS to be no different. So, again, I think we have a different view on this one."

857. First, the Independent Expert's summary of groundwater investigation findings (Table 5.2) lists the lithology, in terms of percentage of clay, of each site and it shows variability in such percentages at a site. For example, Mono 1, CPF records a clay content of 34.1% to the north of the platform, 14.9% to the northeast of the platform, 38.8% to the east of the platform in the mud discharge area and 18.2% to the south of the platform.[1037] The Tribunal sees force in the point made by Ecuador that the clay content of soils can vary, sometimes substantially, at a particular site and it makes little sense to exclude groundwater contamination manifesting itself in wells drilled in soils containing more than 25% clay content when there are neighbouring wells drilled in soil that contains less than 25% clay content that also manifest contamination.[1038] The Tribunal shares Ecuador's concern that variability in clay content could lead to ineffective remediation if the 25% "cutoff rule" contended for were to be applied.

858. Second, and related to the point just made, Mr. MacDonald pointed out at the Expert Hearing that the permanent wells installed by Ramboll were able to capture groundwater irrespective of the clay content of the soil.[1039] In his words:

> "There's evidence of groundwater impairment at all wells. We meet the definition of groundwater. There is no narrative in TULAS that says there isn't some remedial obligation if you have more than 25 percent clay, for example. So, that's what we did."[1040]

859. The Tribunal takes from his testimony that TULAS sets standards for the protection of groundwater, not clay, and if the water extracted from a well (irrespective of the percentage

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1037 Consolidated Expert Report, Table 5.2, p. 99.

1038 Tr. (2) (MacDonald) (12 March 2019) 403:7-19.

1039 Tr. (1) (MacDonald) (11 March 2019) 70:14-18: "water encountered by Ramboll at all sampling locations meets the definition of "groundwater" by TULAS, subsurface water that is located in the saturated zone where all pore space filled with water at or above the atmospheric pressure."

1040 Tr. (1) (MacDonald) (11 March 2019) 71:14-19. In response to Perenco's contention that the groundwater samples had been misinterpreted and the chromatograms really showed plant wax, the Expert noted: "…for those wells where it believed we weren't —the findings weren't reflective of petroleum, in each and every well the groundwater had changed, it had odors, in some cases we had petroleum droplets, in some cases there was weathered crude in areas where we put the monitoring wells." Tr. (1) (MacDonald) (11 March 2019) 77:17-22.

of clay content of the soil from which the groundwater was drawn) is contaminated, the TULAS standards should apply.[1041]

860. Therefore, the Tribunal leaves the Independent Expert's approach undisturbed.[1042]

(g) Did the Expert adhere to the Tribunal's instruction that when estimating costs of any remediation for which Perenco is liable, "he shall be guided by Ecuadorian costs"?

861. Perenco asserted that, in contravention of the Tribunal's instructions, Ramboll's unit costs for remediation do not reflect local costs.[1043] It complained that Ramboll never provided a copy of its quotes for the Parties' verification[1044] but instead generated its soil remediation numbers through a database (the "RACER" database) developed in the United States.[1045] These numbers, Perenco argued, substantially exceeded GSI's unit costs, which themselves had been based on the upper range of actual local costs.[1046]

862. Perenco also asserted that Ramboll's two quotes from two local contractors, Hidrogeocol Ecuador and Ecuambiente, were obtained belatedly in the process of the Expert's finalising his report and were not reliable guides. Hidrogeocol's unit cost for transportation and treatment of soil contaminated with TPH and heavy metals amounted to $260/m³, six times higher than Petroamazonas' actual unit cost of $39/m³ for comparable remediation work.[1047] Similarly, Ecuambiente's unit cost for transportation and treatment of soils with just TPH was $56/m³, while Petroamazonas' actual unit cost was $46/m³ for comparable

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1041 Expert's Direct Presentation, Slide 64; Tr. (1) (MacDonald) (11 March 2019) 70-71.

1042 As noted previously, it was contended that the Expert's groundwater samples were starkly different from the results obtained by IEMS and GSI, But Mr. MacDonald pointed out in his Direct Presentation, Slide 68, that: "Neither IEMS nor GSI has made their data available, nor provided details; thus, cannot comment on what is described as remarkably different results."

1043 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 65 and fn. 137; Perenco's Closing Presentatino, Slide 45.

1044 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 66.

1045 Perenco's Closing Presentation, Slide 48 referring to Mr. MacDonald's testimony at Tr. (1) (MacDonald) (11 March 2019) 87:21-88:5.

1046 Tr. (2) (MacDonald) (12 March 2019) 504:3-21; Perenco's Rebuttal Presentation, p. 2.

1047 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 70, contrasting Independent Expert Report, Appendix 19.C with CE-CC-451.

remediation work.[1048] In Perenco's view, the Expert did not appear to have obtained a range of quotes from other contractors nor to have taken account of the fact that quotes provided to foreign companies —especially in the context of litigation— are typically higher.[1049]

863. Perenco submitted, therefore, that the Tribunal should apply the actual costs recently incurred by Petroamazonas itself, which provide the "best guide for estimating comparable remediation works."[1050] These were available from Petroamazonas' own public documents and they showed, in Perenco's submission, that remediation works in Blocks 7 and 21 were substantially lower than Ramboll's estimates, *e.g.* $39/m³ for treatment and disposal of soil with TPH and metals, as compared to Ramboll's estimate of $160/m³.[1051]

864. In sum, Perenco's criticism of the Independent Expert's approach to unit costs was that even though Ramboll claimed that RACER was used only as a reference,[1052] it had actually relied on RACER estimates rather than the belatedly obtained local quotes from Hidrogeocol or Ecuambiente (which were also exaggerated, given the litigation context) or more appropriately, Petroamazonas' costs, as evidenced by publicly-available documents.[1053]

865. The Tribunal considers it useful to set out Mr. MacDonald's explanation of Ramboll's costs "solicitation process."[1054] The first part of his explanation referred to various criticisms made by Perenco and addressed them in turn:

> Belated solicitation of quotes[1055]: "So, one here is that we appear to receive the quotes in late November and December [of 2018]. … but the actual quote —what we'll call 'solicitation process,' began much earlier in the year.

1048 *Id.*

1049 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 70.

1050 *Ibid.*, paragraph 72, referring to Interim Decision on Counterclaim, paragraph 579.

1051 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 69, contrasting Independent Expert Report, Appendix 19.C and Appendix 19.B with CE-CC-451.

1052 Perenco's Closing Presentation, Slide 49.

1053 *Id.*

1054 Tr. (1) (MacDonald) (11 March 2019) 84:18.

1055 For ease of reading, the Tribunal has inserted subject titles into this extract of the transcript.

> What was in the Expert Report was simply the most recent communication that we had. It was not to suggest that that was the date we got some information and in two weeks' time we put it all together. … So, our solicitation process began, really, in the first quarter of 2018 and, again, the December quotes are simply the latest versions after many revisions and clarifications between folks that we reached out to in Ecuador.
> Too few quotes: Ramboll does not appear to have obtained a range of quotes from other contractors. Actually, that's not true. That quote or cost information were solicited from seven contractors in Ecuador and actually total of 11. Four didn't have an interest. But there were communications with several and I'll explain in a minute how we did this, taking into account quotes provided to foreign companies are higher."[1056]

866. Mr. MacDonald then discussed the safeguards that Ramboll took in an attempt to ensure that higher quotes would not be provided either due to its being a foreign company or because the quotes were being used in the context of litigation and therefore might be inflated:

> "… we solicited and utilized a consultant in Ecuador, Hidrogeocol. … they're consultants, and they oversee remedial work and believed that them asking for certain things would be faster, more effective than us because they are local.
> They know each other, and we think generally that proved true.
> The other thing is that these quotes, you know, in a litigation context, are typically higher. We required Hidrogeocol to sign a nondisclosure agreement, so details of the Project, identity of the, I mean —sure, people know what's going on in eastern Amazon, sure, to some degree, but we addressed this by just this factor.
> So, he was talking to them on a local level, not in the context of litigation, not in the context of a U.S. entity, you know, per se, to try to get as true as information as possible. And, well, we did—it was an iterative process and we certainly, over time, incorporated them into our remedial cost estimation."[1057] [Emphasis added.]

867. Mr. MacDonald then explained how RACER was used in Ramboll's cost estimation process:

> "We used RACER. RACER is a database which contains information on many, many projects, 1500 or so from global locations.

1056 Tr. (1) (MacDonald) (11 March 2019) 84:14-15, 17-19-85:1, 4-18.

1057 Tr. (1) (MacDonald) (11 March 2019) 85:20-21, 86:2-21.

> And the idea actually—for full disclosure, the U.S. Air Force developed this database… And over time it became a global database, inputting information from other companies' similar projects. And we use RACER as a bit of a litmus test, confirmation resource, and particularly when there are variations between costs from local contractors, the only costs that had some component of—I'll call it "RACER thinking" related to the treatment, transportation, disposal of soils. …
> In particular, and that was because we've seen a wide range of costs coming out of Ecuador, and we wanted to see how it felt, sort of looked within the context of RACER as a sort of a litmus test and a lot of folks think that the estimates within RACER often come within 10 percent of actual remediation costs.
> Now, I'm not saying that holds true in each and every case, but it is actual experiences companies have had in different places in the world; so why not look at it? It was a supplemental reference, but most all of our costs came from this iterative process of getting actual unit cost pricing from local contractors in Ecuador."[1058] [Emphasis added.]

868. Given the above explanations, the Tribunal accepts that what looked from a reading of the Independent Expert Report at first blush to be a last-minute push to find some remedial cost estimates, was in fact the culmination of a more deliberative process that had gone on for roughly eight months with the intermediation of a local Ecuadorian firm subject to non-disclosure obligations. It further accepts Mr. MacDonald's view that the "use of RACER does not negate the fact that [Ramboll's] costs are very heavy Ecuador-oriented"[1059] and that RACER was used as a "confirmatory tool."[1060] The Tribunal notes that Perenco has argued that Ramboll's estimated costs were higher than the numbers provided in the Ecuambiente quote[1061] but as Mr. MacDonald testified, the unit pricing Ramboll received "came out of Ecuador"[1062], but was too low for the conceptual remediation plan that he and his team developed and therefore the estimates were adjusted upwards.[1063] The Tribunal accepts that this as a proper exercise of Mr. MacDonald's professional judgement.

1058 Tr. (1) (MacDonald) (11 March 2019) 87:1-88:5.

1059 Tr. (1) (MacDonald) (11 March 2019) 205:1-2.

1060 Tr. (1) (MacDonald) (11 March 2019) 204:16-17.

1061 See Perenco's Closing Presentation, Slide 46.

1062 Tr. (1) (MacDonald) (11 March 2019) 202:10.

1063 Tr. (1) (MacDonald) (11 March 2019) 203:21-22; 209:21-210:2.

869. Finally, with respect to its argument that the Tribunal should apply Petroamazonas' costs, Perenco relied on Petroamazonas' 2018 Incinerox waste management contract (and a statement in its 2017 bond offering from which Perenco calculated the cost of the remediation that Petroamazonas had performed), asserting that these are valid prices given that they were obtained through "an open proposal and bid process"[1064] which is "a good way to get low prices"[1065]. In its closing submissions, Perenco highlighted the following text from these documents:

> 2018 Petroamazonas Contract
> "Clause Five: Scope of the Work.-
> 5.3 - Treatment and/or final disposal of the removed waste, owing, for that purpose, to comply with the environmental legal requirements applicable to waste managers and all applicable environmental regulations."[1066]
> Petroamazonas' 2017 Bond Offering
> "On July 1, 2013, Petroamazonas' board established Project Amazonia Viva, which was later approved by the Ministry of the Environment on June 3, 2014. This project seeks to eliminate sources of pollution and remediate contaminated soils, which resulted from exploration and production activities predating Petroamazonas' own operations. Currently, the project encompasses elimination and remediation efforts in exploration blocks 11 (Bermejo), 56 (Lago Agrio), 57 (Shushufindi Libertador), 58 (Cuyabeno), 60 (Sacha), and 61 (Auca), which are carried out in accordance with the Public Policy on Comprehensive Reparation and existing environmental regulations, under the supervision and monitoring of the Ministry of the Environment. For the period ending December 31, 2016, approximately 364,240 cubic meters of soil were remediated and 191 sources of pollution were eliminated as part of Project Amazonia Viva. As a result, Petroamazonas was able to recover approximately 4,959 barrels of crude oil during the 2016 period. To date, Petroamazonas has remediated approximately 732,956 cubic meters of soil and eliminated 520 sources of pollution since the implementation of Project Amazonia Viva in 2014.
> In 2016, Petroamazonas incurred expenses of approximately U.S.$23.1 million for the implementation of Project Amazonia Viva. For 2017, Petroamazonas has an annual budget of U.S.$26.6 million for such project. As of October 2017, Petroamazonas has invested approximately U.S.$19.4 million in this project."[1067] [Perenco's emphasis]

1064 Tr. (2) (MacDonald) (12 March 2019) 504:20-21.

1065 Tr. (2) (MacDonald) (12 March 2019) 505:1-2.

1066 CE-CC-451, Section 5.3; see Perenco's Closing Presentation, Slide 53.

1067 CE-CC-446, p. 86; see Perenco's Closing Presentation, Slide 56.

870. The Tribunal has carefully considered the Incinerox contract issue, in particular, because it is related to Petroamazonas' own remediation efforts in the Blocks and therefore seems to be highly relevant.

871. At the Expert Hearing, Mr. MacDonald pointed out that there was "significant variability" in the unit costs provided to Petroamazonas. For example, while Perenco pointed to a contractor who evidently provided soil remediation services for TPH and metals at a cost of US$39.06/$m^3$, a different Petroamazonas contract carried a price of US$455.88/$m^3$, *some 12 times higher*, for remediation services.[1068] Mr. MacDonald noted further that the scope in the Incinerox contractual documents did not identify the specific remedial technologies that would be employed. Therefore, he was skeptical of the suggestion that there really was true comparability between the Incinerox contract's services and what he contemplated should be done:

> "…We've seen a couple of these RFPs. I cite two of them here, for soil remediation of petroleum and metals, $39 a cubic meter to $455 a cubic meter. Our unit pricing was 160, $150-160 a cubic meter. And —but the scope in Petroamazonas' contract documents did not identify specific remedial technologies. So, you have to know more in order to determine whether there's a valid comparison.
> So, and it doesn't mean that our unit cost pricing is unreasonable. We believe that it's not."[1069] [Emphasis added.]

And:

> "it's not clear specifically whether if some treatments contemplated what is it and where is it embedded in these costs. So, I think we're very confident in the unit pricing that we've developed for treatment, transportation, and disposal. What's also clear in Ecuador is that the kinds of materials and the contamination at these sites do require treatment. It's not a direct excavate, transport, dispose. So, there's a treatment component and that has to be carefully understood and clear. And at least from my initial glance of this, it wasn't entirely clear whether treatment was contemplated or not."[1070] [Emphasis added.]

1068 Expert's Direct Presentation, Slide 91.

1069 Tr. (1) (MacDonald) (11 March 2019) 90:3-13.

1070 Ibid., 245:12-246:3; see also Ecuador's Closing Submissions, p. 23.

872. The Tribunal shares the Independent Expert's doubts that the services contemplated by the Incinerox-Petroamazonas contract are comparable in scope and sophistication to what is required to implement his remediation plan.

873. The Tribunal notes further Mr. MacDonald's concern that the reverse auction process employed by Petroamazonas serves to bring costs down but "it's not guaranteeing that there isn't some effect … of work quality."[1071] Perenco itself adverted to this in its closing submissions and it is an important point, in the Tribunal's view.[1072]

874. Mr. MacDonald moreover did not believe that it could be assumed that Petroamazonas' costs are reflective of local costs in general. He testified in this regard at the hearing:

> "Now, here's the thing with Petroamazonas, and, yes, they do some of their own remedial work; right? Whether it's spills, releases, other things, and they are doing it themselves; … so, they themselves might provide things like security, and community relations, and areas for equipment storage, and all the infrastructure, and borrowed materials and, I mean, various other things that might go into a remediation project, but that's different than a potentially then a third-party implementing remedial work on behalf of a responsible party.
>
> So there is no basis for us to assume at this stage that if any remedial work is done that is done by Petroamazonas. I don't know that, as opposed to a third-party contractor. And I suspect that —but, again, I don't know, but they would have to be very dedicated resources, so I didn't see here that it was our job to try to handicap our costs assuming that Petroamazonas would implement any remedial work at the end as opposed to a third party… .[1073] [Emphasis added.]

875. In the end, the Tribunal is satisfied that Mr. MacDonald's costs are usable, reasonable and consistent with the Tribunal's prior direction that local unit costs be employed.

1071 Tr. (1) (MacDonald) (11 March 2019) 284:6-11.

1072 Tr. (2) (MacDonald) (12 March 2019) 505:1-4: The reverse auction process, "Mr. MacDonald acknowledges, is a good way to get low prices, although he doesn't like that it could have negative consequences if vendors don't comply with their obligations."

1073 Tr. (1) (MacDonald) (11 March 2019) 89:2-90:1.

4. The Tribunal's quantification of the damages payable by Perenco

876. Having reflected on the evidence and the Parties' submissions, the Tribunal began by seeking to focus on the "knowns" of the contamination identified by the Independent Expert. Contamination associated with Perenco's mud pits and wells were first addressed. As for the other forms of contamination, the Tribunal focused on: (i) the type of contamination; (ii) where the contamination was located; (iii) whether the substances detected were associated with drilling or with ongoing oilfield operations; (iv) whether any of the wells where the contamination was found were drilled by Perenco; (v) how long a platform had been used before Perenco arrived on the scene; (vi) whether there was record evidence showing spills or other contamination at the site prior to, or during, Perenco's operatorship; and (vii) whether, in the case of groundwater contamination, the groundwater monitoring well at which the contamination was detected was proximate to contamination or a site feature (*e.g.*, mud pit, formation water pit) which had already been attributed to either a predecessor or to Perenco.[1074] The Tribunal also took note of instances where Perenco accepted partial or full responsibility for contamination at a particular site or area of a site.

877. If a site was one which was contaminated by barium and the well had been drilled by a Perenco predecessor, the Tribunal decided that contamination should not be attributed to Perenco. For example, Lobo 01 was drilled in February 1989; 100% of the remediation costs ($1.361 m) was allocated to the 'Perenco predecessors' responsibility bucket'.

878. Conversely, if an incident of contamination was indubitably tied to Perenco's operations (Perenco-drilled wells and mud pits being the leading examples), or one for which Perenco accepted partial or full responsibility (*e.g.*, Mono CPF, where Perenco accepted responsibility for "some costs" for an oil spill in 2008[1075]), the estimated remediation costs associated therewith were included in 'Perenco's responsibility bucket'. For example, the Jaguar 9 production wells were drilled by Perenco in July 2004. The $541,000 for soil

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1074 Some groundwater contamination was attributed to a likely source (say a mud pit). If it was non-Perenco, then all remedial responsibilities were assigned the predecessor(s) (*e.g.*, Coca-2-MW1), and if Perenco's, then all remedial responsibilities were assigned to Perenco (*e.g.*, Oso 9).

1075 Annex 1 to Perenco's Comments to the Independent Expert Report dated 22 February 2019, p. 15.

remediation found by the Independent Expert was allocated entirely to Perenco's responsibility bucket.

879. Likewise, the mud pits at Oso 9, 10-12, 15-20 give rise to a $5.317 million remediation cost and a groundwater remediation cost of $3.415 million. Both were allocated to Perenco. The Tribunal reasoned in this regard that groundwater impairment areas adjacent to mud pits or former formation water pits were more likely than not to be associated with those structures and were therefore attributed to the entities that constructed or used them.[1076] (The Tribunal also considered that in some cases it could not discount contributions by Petroamazonas to groundwater impairment (*e.g.* the API separator at Coca 2/CPF, Gacela 1/CPF and Payamino 1/CPF). Hence for groundwater impairment remediation costs, in those cases, the Tribunal not only allocated costs as between Perenco and its predecessors, but also included Petroamazonas in the time-weighted allocation.)

880. As noted above at paragraph 877, the Tribunal also considered the type of contaminant. Barium was associated with well drilling and allowed the Tribunal to allocate barium exceedances to the category of the drilling operator (*i.e.*, Perenco or its predecessors). Where the environmental media were affected by TPH, the Tribunal considered that this was a result of an operational release of crude oil. Such operational releases could occur before, during, or after Perenco's operatorship.

881. Thus, for certain issues, particularly in the areas of soil and groundwater contamination, the time-based allocation method was also employed. Given that contamination can occur from ongoing operational mishaps and mix with contamination caused by previous operators, allocating responsibility based on time of operations is, in the Tribunal's view, an appropriate method to deal with the uncertainty.

882. As a result of this exercise, the Tribunal considered that responsibility could fall within five combinations of persons responsible therefor:

[1076] An example going in the opposite direction is Coca 2. The impairment north of the formation water pit and west of the mud pit was fully attributed to predecessors.

(i) Instances where the contamination identified by the Independent Expert was attributable to Perenco's predecessors only (for example at sites where exceedances of barium alone or with other metals were associated with well drilling conducted by a prior operator);

(ii) instances where the contamination was attributable to Perenco (for example where exceedances of barium alone or with other metals was associated with well drilling by Perenco or in the case of Perenco's mud pits);

(iii) instances where the contamination was attributable to Perenco, its predecessors and its successor (for example, where each used a particular operational structure (*e.g.*, an API separator) at a site where groundwater impairment was found);

(iv) instances where the contamination was attributable to Perenco and its predecessors, but not to Petroamazonas (due to the limitations on the Independent Expert's sampling discussed above which lessened the chances of post-Perenco contamination being found); and

(v) instances where the contamination was attributable to Perenco and Petroamazonas (due to the fact that the site was developed by Perenco and Petroamazonas continued operations there).

883. In the latter three combinations, in some instances, the Tribunal allocated the costs of remediation as between Perenco and another party or parties based on record evidence of timing of well drilling and/or mud pit construction and use, spills or other incidents, and taking into consideration Perenco's express assumption of responsibility (but not being bound by any limitations contained therein). In other cases, the time-weighted approach was employed when the record evidence could not be used to discern between Perenco's predecessors' activities and those of Perenco.

884. For example, with respect to Jaguar 01, which was drilled from November 1987 to January 1988 and operated by Perenco's predecessors before Perenco arrived on the scene, in Annex 1 to Perenco's comments on the Independent Expert's Report, Perenco assumed responsibility for "some costs" for soil and groundwater remediation.[1077] The Tribunal has fixed responsibility on Perenco for the impact of TPH contamination around the valve station, which had resulted from an oil spill reported in 2005-06, as well as partial

[1077] Annex 1 to Perenco's Comments to the Independent Expert Report dated 22 February 2019, pp. 2 & 5 (based on Ramboll's Estimated Costs).

responsibility for the swampy area downslope of the valve station. In this case, the Tribunal has allocated US$1.997 million to Perenco's predecessors and US$1.107 million to Perenco. (The latter figure does not include US$438,000 for remediation of TPH detected in groundwater which the Tribunal attributes to a release in 2005/06, during Perenco's operatorship.)

885. Similarly, in Jaguar 02, drilled in January 1994 and taken out of service in 2000, and therefore only operated by Perenco's predecessors, there was a pre-existing non-Perenco mud pit which experienced a slope failure. This was not attributed to Perenco. Contamination in the barium and other metals-affected areas northeast of the platform, west of the mud pit, and along the northern stream was also attributed to Perenco's predecessors. For the areas with surficial crude resulting from the spill in 2006, Perenco was considered wholly responsible. In Annex 1 of Perenco's comments on the Report, Perenco assumed responsibility for "some costs" associated with soil remediation due to an oil spill "of unknown date" and "some costs" for groundwater remediation.[1078] In the result, a small part of the responsibility was allocated to Perenco (US$196,000 for Perenco versus US$8.308 million to its predecessors).

886. In cases of likely layering of contamination by successive operators, the Tribunal employed a time-based allocation of remedial costs based on Perenco's length of operatorship as a percentage of (i) its predecessors' operatorships, (ii) Petroamazonas' operatorship, or (iii) both. The timeframe selected to allocate responsibility as between Perenco and its predecessors assumed that releases to the environment began at the time of the first production well installation and continued through to July 2009. For affected areas that could be attributed to CPF operations, the initial release was assumed to have occurred when the CPF was constructed. In this respect, the allocation of responsibility to Perenco is conservative, because it does not consider the possibility of later contaminant release dates and the fact that not all of the oil fields were actively exploited by prior operators after the date of first production well installation.

[1078] *Ibid.*, p. 2.

887. Time-weighted sharing was used for soil contamination (when the record evidence could not be used to allocate costs, as noted in paragraph 883 above), and groundwater impairment. For example, with respect to the Gacela 02/CPF, for the groundwater impairment downstream of the API separator, the Tribunal considered it appropriate to allocate some responsibility to Petroamazonas due to its continued use of the separator. For the groundwater impairment to the southeast of the facility, the soil samples were collected shortly after Perenco's tenure came to an end and responsibility therefor is allocated as between Perenco and its predecessors. As a result, Perenco was assigned US$452,530 in remedial costs, its predecessors were assigned US$458,990, and Petroamazonas was assigned US$485,480 in remediation costs.

888. The approach taken by the Tribunal, as just described, had been applied to each site and the results of this process are set out in Annex A to this Award which sets forth the Tribunal's findings in tabular form for: (i) sites where Perenco used mud pits and/installed crude oil production wells; (ii) sites where responsibility for soil remediation is allocated between prior operators and Perenco; (iii) groundwater sites where responsibility is allocated between prior operators, Perenco, and Perenco's successor; and (iv) certain other sites that the Tribunal has accepted give rise to responsibility on Perenco's part.

889. Applying the foregoing approaches, the remedial responsibilities estimated by Mr. MacDonald in the Independent Expert Report were allocated as follows (prior to further adjustment):

A. Mud pits and Perenco-installed wells

The total remedial estimate of **US$50,017,000** is associated with sites where Perenco used mud pits or installed production wells.

Of this sum:

US$49,604,320 is attributed to Perenco,

US$114,080 is attributable to Perenco's predecessors, and

US$298,600 is attributable to Perenco's successor.

B. Other soil remediation

For sites operated by Perenco where it did not use mud pits or install production wells, total remedial costs for soils amount to **US$88,538,000**.

Of this sum:

Applying the time-based allocation method, **US$27,522,810** is attributed to Perenco, and

US$61,015,190 is attributable to Perenco's predecessors.

C. Groundwater

Total remedial costs for groundwater amount to **US$21,326,000**.

Of this sum:

Applying the time-based allocation method, **US$8,856,760** is attributed to Perenco:

US$11,250,680 is attributable to Perenco's predecessors, and

US$1,218,550 is attributable to Perenco's successor.

The total attributed to Perenco before adjustment is **US$85,938,890**.

D. Adjustment

The Tribunal has found that it must make an upward adjustment to this figure to account for certain sites identified by Ecuador which the Expert overlooked or was unable to sample. It has thus added the sum of US$7.7 million for remediation of mud pits at Payamino 16 and Yuralpa B, and the remediation of groundwater at the Yuralpa landfill.

This brings the total to **US$93,638,890**.

5. Effect of the *Burlington* award

890. The Tribunal turns to the issue of how to deal with the *Burlington* award. It will be recalled that that tribunal left it to the present Tribunal to sort out the question of potential double-recovery of damages.[1079]

[1079] The Tribunal noted at paragraph 1086 of its Decision on Counterclaims: "As of the date of the present Decision, the *Perenco* tribunal has issued no decision yet on the counterclaims before it. Therefore, this

891. In the latest phase of this proceeding Ecuador has not disputed that there is a substantial territorial overlap between the contamination to be remediated as estimated by Mr. MacDonald and that estimated by the *Burlington* tribunal.[1080] It is evident, however, that Mr. MacDonald identified for remediation larger areas and additional volumes of soil contamination, additional mud pits and additional sites with groundwater contamination, and used higher in-country remediation costs than the *Burlington* tribunal estimated.[1081] Ecuador argued that Mr. MacDonald thus did not find the same harm as the *Burlington* tribunal and Perenco remained liable for the additional and/or different remedial areas, volumes and costs.[1082]

892. Ecuador therefore proposed a framework based on a site-by-site comparison of areas, depths, volumes and costs between identified by Mr. MacDonald and the *Burlington* tribunal.[1083] In case of any uncertainty, Ecuador stated that it had assumed there was an overlap and gave credit to Perenco. Under the framework, on Ecuador's analysis, Perenco was liable for US$130,801,100:[1084]

(a) **Soils**: Perenco was liable for the additional remedial volumes and costs for the following: (i) sites for which the *Burlington* tribunal did not award any remedial costs; (ii) sites where Mr. MacDonald delineated different areas; sites or areas where Mr. MacDonald's sampling concluded that contamination extended beyond or deeper than the *Burlington* tribunal's findings; (iii) sites or areas where the horizontal and vertical extent of the contamination estimated by Mr. MacDonald and the Burlington tribunal were similar, but in respect of which Mr. MacDonald estimated higher remediation costs.[1085]

Tribunal lacks the necessary information or basis to adopt any specific measures – to fashion its decision, to borrow Ecuador's phrase – to prevent double recovery, a task that it must leave to the *Perenco* tribunal as the one deciding in second place. This being said, this Tribunal nonetheless states that, as a matter of principle, the present Decision cannot serve and may not be used to compensate Ecuador twice for the same damage."

1080 Ecuador's Cover Submissions dated 22 February 2019, paragraph 80.

1081 *Id*.

1082 *Id.*

1083 *Ibid.*, paragraph 81 and Appendix A.

1084 Appendix A to Ecuador's Cover Submissions dated 22 February 2019.

1085 Ecuador's Cover Submissions dated 22 February 2019, paragraph 82.

(b) **Mud pits**: Perenco was liable for the higher remediation costs at Cóndor Norte and the Payamino WTS as well as the full remediation costs estimated for non-compliant mud pits at 11 sites, for a total of US$ 28,304,000.[1086]

(c) **Groundwater**: Perenco was liable for the nine additional sites identified by Mr. MacDonald as requiring groundwater remediation and the estimated higher costs for the remediation of Coca 2/CPF.[1087]

893. In addition, Ecuador argued that it was entitled to abandonment costs in addition to the US$929,722 granted by the *Burlington* tribunal for the seven sites listed in Perenco's November 2008 Well Site Abandonment Plan that was never carried out and which sites Petroamazonas never operated.[1088]

894. Perenco's argument on this point in essence was that the *Burlington* payment pursuant to the Settlement Agreement "irrevocably, fully and finally paid and discharged, and satisfied" all of the Consortium's obligations and liabilities related to Ecuador's counterclaims.[1089] If that argument was not accepted, at the very least, in Perenco's submission, that amount paid must be set off from any remediation costs that this Tribunal might award to Ecuador in this proceeding.[1090] Perenco argued that Ecuador did not dispute this.[1091] Applying its proposed corrections to Mr. MacDonald's findings, which would result in damages lower than what Ecuador had already received in full satisfaction of its counterclaims, the Tribunal should enter an award of zero counterclaims damages.[1092]

895. The Tribunal obviously has charted a different course from that proposed by either Party. It has not estimated damages of US$130,801,100 payable to Ecuador by Perenco, nor has it agreed with Perenco's 'zero counterclaims damages' contention.

1086 *Ibid.*, paragraph 83.

1087 *Ibid.*, paragraph 84.

1088 *Ibid.*, paragraph 85.

1089 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 74, and referring to CE-CC-431, Annex 3, p. 4, paragraph 2.

1090 *Ibid.*, paragraph 74, and referring to CE-CC-431, Annex 3, p. 3, WHEREAS (5).

1091 *Ibid.*, paragraph 74.

1092 *Id.*

896. By the time of the Expert Hearing, Ecuador was acknowledging that a substantial overlap environmental damages existed between the US$39,199,373 awarded by *Burlington* and what Mr. MacDonald has found. (At the Expert Hearing, Ecuador indicated that the maximum amount subject to double-recovery was US$29,078,900.)[1093] Mindful of the *Burlington* tribunal's statement that "as a matter of principle, the present Decision cannot serve and may not be used to compensate Ecuador twice for the same damage"[1094], the Tribunal has thought long and hard about how to protect against double recovery.

897. The two tribunals have addressed the issues in significantly different ways, both substantively, in terms of their findings on Ecuadorian law, and technically, in terms of evaluating the expert evidence of contamination in the Blocks. The *Burlington* tribunal relied upon IEMS' and GSI's sampling as augmented by the tribunal's site visit to the Blocks. The present Tribunal had doubts about the work of both side's experts and opted to make the main findings on Ecuadorian law that would allow the Parties the possibility to negotiate a settlement and if they were unable to do so, the Tribunal indicated its intention to appoint an independent expert.

898. No disrespect at all is intended to the distinguished members of the *Burlington* tribunal, each of whom the present Tribunal holds in high regard, by the present Tribunal's deciding that Mr. MacDonald was better situated than that tribunal to estimate the extent of contamination. The work performed by Mr. MacDonald and his team from Ramboll is more likely to have comprehensively and accurately analysed the work of IEMS/GSI (both their strengths and weaknesses) than the *Burlington* tribunal was able to do. After thoroughly reviewing that work and designing a further sampling campaign in consultation with the Parties, Mr. MacDonald was, in the present Tribunal's view, in a far better position to capture and delineate the extent of the contamination in the areas of the Blocks that he was permitted to measure. Hence, the Tribunal has decided to treat the US$39,199,373 awarded by the *Burlington* tribunal, and paid by Burlington in its settlement, as a down

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1093 See Appendix A to Ecuador's Comments to the Independent Expert Report dated 22 February 2019, "Totals."

1094 *Burlington* Decision on Counterclaims, paragraph 1086.

payment towards the total amount of damages that the present Tribunal has determined are payable by Perenco, the actual operator of the Consortium.

899. The grand total after adjustments of US$93,638,890 stated above at paragraph 889 is thus further adjusted by crediting to Perenco the prior payment of US$39,199,373 to arrive at a figure of US$54,439,517 which Perenco shall pay to Ecuador.

6. Direction on Ecuador's use of the proceeds

900. Perenco argued that any damages awarded to Ecuador should not be used to offset the damages owed to Perenco. The Tribunal should instead order that Ecuador deposit that amount into a remediation fund that Ecuador must use solely for the purpose of remediating the Blocks.[1095] This, according to Perenco, was the only way to ensure that the Tribunal's objective of protecting the environment was truly achieved and that Ecuador fulfilled its promises to use the funds to remediate, and that the entire counterclaims process is not subverted for Ecuador's opportunistic monetary gain.[1096] Perenco noted that Ecuador had no objection to such an order and all that a remediation fund would do would be to hold it to its word.[1097]

901. On this point, Ecuador's Attorney-General confirmed at the Expert Hearing Ecuador's prior statement during the earlier counterclaims phase that "any damages that will be granted to Ecuador for the counterclaims would be devoted to the restoration of the ecosystems and Ecuador wouldn't have any problem whatsoever if the Tribunal felt an order to this point should be made, an order saying that any damages that would be granted to Ecuador shall be devoted to the full restoration of the ecosystems as provided for in the Constitution of Ecuador."[1098]

1095 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 75.

1096 Perenco's Comments to the Independent Expert Report dated 22 February 2019, paragraph 75; Tr. (2) (MacDonald) (12 March 2019) 468.

1097 Tr. (2) (MacDonald) (12 March 2019) 470.

1098 Tr. (2) (MacDonald) (12 March 2019) 375:2-13.

902. The Tribunal has reflected on the Parties' submissions. Insofar as Perenco's request for two separate awards of damages being made, one in favour of each Party, with the counterclaims damages to be paid into a remediation fund, the Tribunal observes that making an order that would require continued monitoring of Ecuador's remediation activities would be inconsistent with the Tribunal's role under the ICSID Convention. Subject only to the limited procedures contemplated in Articles 49-51 of the Convention, upon issuing its Award, the Tribunal is *functus officio*.

903. The Tribunal moreover believes that it is in both Parties' interests to bring this lengthy proceeding to an end and thereby allow both to move forward. For that reason, the Tribunal has decided to issue a single Award which specifies the damages owed by each Party to the other, together with awards of costs associated therewith.

904. At the same time, the Tribunal expresses its firm expectation, based on solemn representations made by both counsel for Ecuador and the Attorney General himself, which the Tribunal has accepted, that the proceeds of the damages award made in favour of Ecuador in the environmental counterclaim will be devoted to remediation of the Blocks. The State has made plain its interest in remediating the contamination caused by oilfield operations in the *Oriente* region of Ecuador. The Tribunal therefore states its clear expectation that the monies payable to Ecuador will be devoted to this important task and will not remain in the State's general revenues.

IV. DAMAGES CLAIMED IN RELATION TO THE INFRASTRUCTURE COUNTERCLAIM

905. The Tribunal now turns to consider the infrastructure counterclaim. A number of points need to be made in respect of this counterclaim:

(a) Ecuador raised exactly the same infrastructure counterclaim in the *Burlington* arbitration as it has in this case against Perenco.[1099]

[1099] See Resp. PHB CC, paragraphs 118 & 122: Declaring "that Claimant is liable towards Ecuador for the costs required to remedy the poor state of the infrastructure of Blocks 7 and 21 left behind by Perenco, given

(b) Both counterclaims are based on the alleged breaches of the identical provisions in the PSCs for Blocks 7 and 21[1100], and of Ecuadorian law.[1101]

(c) As can be seen in Annex B to this Award, the witnesses in respect of both infrastructure counterclaims appear to be almost identical.

(d) The *Burlington* tribunal held a site visit which this Tribunal did not.[1102]

(e) The amount claimed in both counterclaims was virtually identical.[1103]

(f) Having visited the premises and heard from witnesses, the *Burlington* tribunal awarded Ecuador the sum of US$2,577,119 itemized as follows:[1104]

(i) US$503,572.76 for the Gacela T-104 and Payamino-tanks, as well as minor repairs to the pipelines;

(ii) US$1,462,553.43 for repairs related to pipelines and fluid lines; and

(iii) US$561,900 for Block 7 engines and US$49,093.58 for new vehicles.

Claimant's breach of [the Contract and Ecuadorian law]" and Ordering "Claimant to pay damages for its failure to return the Blocks' infrastructure in good condition to Ecuador, in an amount quantified at US$17,231,458.85." c.f. *Burlington* Decision on Counterclaims, paragraph 53: Declaring "(ii) That Burlington is liable towards Ecuador for the costs required to remedy the poor state of the infrastructure of Blocks 7 and 21 left behind by Burlington" and Ordering "(iv) Burlington to pay damages for its failure to return the Blocks' infrastructure in good condition to Ecuador in an amount quantified at US$17,417,765.42 with interest at an adequate commercial interest rate from the date of disbursement thereof until the date of the Award."

1100 See paragraphs 892 & 908 of *Burlington* Decision on Counterclaims, where both Ecuador and Burlington refer to Clause 5.1.8 of the Block 7 PSC and to Clause 5.1.7 of the Block 21 PSC.

1101 See Resp. PHB CC, paragraph 102: "Perenco's low-cost operations breached Articles 5.1.7 and 5.1.8 of Block 7 and 21 [Participation Contracts] which required it to use equipment and technology in accordance with the best standards and practices of the international oil industry. Regardless of whether Perenco's no-investment policy was in breach of its contractual obligations, the Hearing confirmed that Perenco returned the Blocks' infrastructure to Ecuador in appalling condition exceeding normal wear and tear in breach of the 'obligation de résultat' in Articles 5.1.22 and 18.6 of Block 7 [Participation Contract] (Articles 5.1.21 and 18.6 of Block 21 [Participation Contract]) and Article 29 of the [Ecuadorian Hydrocarbons Law No. 2967] …" c.f. *Burlington*, Decision on Counterclaims, paragraphs 891-892: "Ecuador argues that, under both the PSCs and Ecuadorian law, the Consortium was under a dual obligation (i) to construct, maintain and replace the infrastructure on Blocks 7 and 21 in accordance with industry standards and (ii) upon contract termination, to return the Blocks to the State in good working condition. According to Ecuador, the Consortium breached both obligations and Burlington is accordingly liable for the remedial costs" and "Ecuador contends that … Article 29 of the Hydrocarbons Law, incorporated by reference in the PSCs, also provides for an obligation to turn over the infrastructure to the State 'in good condition'."

1102 See *Burlington* Decision on Counterclaims, paragraphs 18-27.

1103 See note 1099 above.

1104 See *Burlington* Decision on Counterclaims, paragraph 1074.

(g) The *Burlington* case has now been completed with an award of 7 February 2017.[1105]

(h) Ecuador, while initially seeking annulment of the damages awarded against it in favour of Burlington and also of the decision on its environmental counter-claim, did not seek annulment of the damages awarded to it in respect of the infrastructure counterclaim.[1106]

(i) Ecuador and Burlington thereafter entered into the Settlement Agreement pursuant to which the application for annulment of the *Burlington* award was withdrawn.[1107]

(j) This Tribunal has already ruled that it will not dismiss the infrastructure counterclaim or the environmental counterclaim on the grounds of *res judicata*.[1108]

906. Accordingly, this Tribunal will have to consider the infrastructure claim, but must take into account that another tribunal has already ruled on it and awarded damages in respect of it. That tribunal not only heard virtually the same evidence about the same breaches and considered the same allegations as to damage, but personally observed the climatic and other conditions when it conducted its site visit.[1109]

907. What is more, as noted above, Ecuador did not seek the annulment of the part of the *Burlington* award relating to infrastructure,[1110] so it must be assumed for present purposes

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1105 *Burlington* award.

1106 Ecuador's Application for Annulment dated 13 February 2017, E-426, paragraph 64, setting out the specific grounds for Ecuador's Annulment Application

> "*… with respect to Ecuador's claims, the Tribunal manifestly exceeded its powers and failed to state its reasons when it decided that the strict liability regime of the 2008 Constitution has no retroactive effect …, the Tribunal manifestly exceeded its powers and failed to state its reasons when it decided that the relevant permissible limits are not those applicable to sensitive ecosystems…, the Tribunal failed to state its reasons for failing to perform vertical delineation…, and the Tribunal exceeded its powers and failed to state its reasons upon which its consecutive findings are made when it decided on the apportionment of liability between Burlington and others*."

1107 CA-CC-121, *Burlington* Order of the Secretary-General Taking Note of the Discontinuance of the Proceeding.

1108 Decision on Perenco's First Dismissal Application, paragraphs 47-51.

1109 See paragraphs 905 1(b), 905 1(c), and 905 1(d) above.

1110 See paragraph 905 1(h) above.

that it was content with such an award. Ecuador has rightly stated that it cannot benefit from double recovery, so in many respects this Tribunal's task is largely duplicative.[1111]

908. It is necessary at the outset to pay careful regard to what the *Burlington* tribunal said in paragraphs 1080 to 1086 of its Decision on Counterclaims which are set out below:[1112]

> "1080. As a final matter, the Tribunal must address the issue of double recovery. As mentioned in paragraph 70 above, Burlington has called the Tribunal's attention to the potential risk of double recovery in respect to the Respondent's counterclaims since Ecuador "made a full claim for the alleged environmental harm in each of the Burlington and Perenco cases." Burlington requests that the Tribunal address the "potentially pernicious consequences" deriving from that risk so that "if the dispositive part of either of the Awards on counterclaims provides for any compensation, Ecuador would be prevented from enforcing the second award for the extent that it has already been compensated by the first".
>
> 1081. The Tribunal notes that there is no dispute between the Parties on the issue of double recovery. More specifically, first, there is no question that Ecuador claims compensation for the same damages in these and in the parallel *Perenco* proceedings. For Burlington, Ecuador is "twice seeking 100% recovery of precisely the same alleged damages for precisely the same alleged injury on precisely the same legal and factual bases." Ecuador, for its part, does not deny that it seeks compensation for the same harm in both cases, although it distinguishes the two arbitrations in various ways, stating for instance that the arguments or the evidence in both cases are not "exactly the same". Ecuador actually relies on the joint and several liability of the Consortium partners to justify its claim against Burlington although only Perenco operated the blocks.
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> 1082. Second, it is also common ground that claiming compensation for the same damage in parallel proceedings creates a risk of double recovery.

1111 See Response, paragraph 110: "Ecuador has always agreed to avoid double recovery in relation to its counterclaims, as stated in numerous occasions throughout both this and the Burlington arbitration. Ecuador's latest undertaking was made in the context of the Burlington Settlement, whereby it accepted that '*Ecuador no tiene derecho a recibir y no procurará una doble compensación en relación con los mismos montos y daños ambientales y de infraestructura, constantes en la Decisión sobre las Reconvenciones en contra de Burlington*'." See also fn. 158: "Hearing on Counterclaims, Transcript (ENG), D8:P2426:L12-P2428:L8 (Arbitrator Kaplan, Silva Romero) ("ARBITRATOR KAPLAN: So if [Ecuador] were to recover something in this one less than your full claim, then you would seek the balance in the other one; is that right? MR. SILVA ROMERO: I think we have the duty to inform the Burlington Tribunal about the damages we would obtain in the Perenco Tribunal, indeed. Yes, sir."); Burlington 2014 Hearing on Counterclaims, Transcript (ENG), D7:P2341:L13-1 (Opening, Silva Romero) ("The second comment I am specifically instructed to make *today is that we don't want the Burlington Tribunal to have any concern regarding double recovery. This is not what Ecuador is looking for. Ecuador is simply looking for the restoration of the ecosystems in Blocks 7 and 21*", **E-440**. See also, *Burlington* Decision on Counterclaims, ¶ 70, **CA-CC-59**."

1112 *Burlington* Decision on Counterclaims [footnotes omitted].

> In this context, Ecuador submits that whichever Tribunal issues the later award on Ecuador's counterclaims can readily address the risk and thus Burlington's fear of "pernicious consequences" is misplaced:
>
> "Ecuador … adds that its counterclaims will not result in '*pernicious consequences*'. If Claimant alludes to the issue of double recovery, the prohibition thereof exclusively applies when a party has already been indemnified by a third party. In addition, Claimant cannot pretend to ignore that any second award in the present cases against the Consortium members'*could be fashioned in such a way as to prevent double recovery'*. International law, Ecuadorian law and international decisions offer numerous mechanisms for preventing double recovery, including by taking into account the monetary relief granted by any prior award".
>
> 1083. Third, there is common ground between the Parties that a creditor can only be compensated once for a given harm, and rightly so, as a number of arbitral tribunals have acknowledged that the "prohibition of double recovery for the same loss is a well-established principle."
>
> 1084. Fourth, the Tribunal takes note that, prior to the end of the Hearing on counterclaims, counsel for Ecuador clearly stated that Ecuador does not seek double recovery in its claims against the Consortium members:
>
> "The second comment I am specifically instructed to make today is that we don't want the Burlington tribunal to have any concern regarding double recovery. That is not what Ecuador is looking for."
>
> 1085. The Tribunal takes due notice of Ecuador's representations, which are in line with the general principle prohibiting double recovery.
>
> 1086. As of the date of the present Decision, the *Perenco* tribunal has issued no decision yet on the counterclaims before it. Therefore, this Tribunal lacks the necessary information or basis to adopt any specific measures – *to fashion its decision*, to borrow Ecuador's phrase – to prevent double recovery, a task that it must leave to the Perenco Tribunal as the one deciding in second place. This being said, this Tribunal nonetheless states that as a matter of principle, the present Decision cannot serve and may not be used to compensate Ecuador twice for the same damage." (Emphasis on the original)

909. Nevertheless, consistent with the Tribunal's independent duty to consider the case presented to it, the Tribunal will briefly explain its views.

910. The Tribunal bases its determination of the counterclaim on two major considerations.

911. The first is that it is satisfied that in the declining years of the Blocks Perenco would, on the balance of probabilities, have been less concerned about maintaining the facilities than

hitherto.[1113] Accordingly, it would not surprise the Tribunal that there were in fact some breaches of the obligations in the PSCs set out below.

912. On the other hand, the Tribunal is conscious of the challenging conditions of operating in the Amazon rainforest and the predisposition towards rust and corrosion in that climate.[1114] The Tribunal is also conscious that the Blocks had been operated both before and after Perenco's tenure of the Blocks.[1115]

A. Legal Position

913. It is not disputed that certain clauses of the PSCs cover the Consortium's obligations with respect to the infrastructure of the Blocks not only during the operation of Blocks 7 and 21, but also upon the termination of the PSCs.[1116]

914. Clause 5.1.8 of the PSC for Block 7 and clause 5.1.7 of the PSC for Block 21 required the Consortium to use qualified personnel and suitable equipment and technology during the operation of the blocks.

915. Clause 5.1.8 reads as follows:[1117]

> "5.1 Obligations of the Contractor: ...
> …

1113 See also paragraph 252 above: "*In the Tribunal's view, it is a given that the Consortium's thinking would have been dominated by the looming contract expiry. The Tribunal believes that the sharply rising price of oil leading up to October 2007 would have induced Perenco to seek to drill as many wells as were economically possible in the Oso field in the time remaining in that Contract. According to Mr. Crick, in the absence of a contract extension, Perenco would have stopped drilling in Block 7 in August of 2009 in order to ensure an adequate payback on the new wells. Mr. Crick estimates that Perenco could have drilled 24 wells per year in Block 7. The Tribunal agrees and accepts Mr. Crick's production profiles.*"

1114 Interim Decision on Counterclaim, paragraph 408.

1115 The comments made with respect to Ecuador's claim for environmental damages are likewise applicable to the infrastructure claim. See Interim Decision on Counterclaim, paragraphs 490, 589, 591, 597 and 598.

1116 See Ecuador's Counter-Memorial on Liability and Counterclaims, paragraphs 916, 918-919, referring to Clauses 5.1.7 and 5.1.21 of the Block 21 Participation Contract and Clauses 5.1.8 and 5.1.22 of the Block 7 Participation Contract as well as Clauses 18.6 of the two Participation Contracts and Article 29 of the Hydrocarbons Law, incorporated by reference into the Participation Contracts. *C.f.* Perenco's Counter-Memorial on Counterclaims, paragraphs 516 and 524-525, referring to the same clauses and provision.

1117 CE-CC-028.

> 5.1.8 Employ qualified personnel, as well as equipment, machinery, materials and technology, in accordance with the generally accepted norms and practices of the international petroleum industry."

916. Clause 5.1.7 similarly provides:[1118]

> "5.1 Obligations of the Contractor: …
> …
> 5.1.7 To use personnel, equipment, machinery, materials, and technology in accordance with the best standards and practices generally accepted in the international hydrocarbon industry."

917. Upon termination of the PSCs, clauses 5.1.22 and 18.6 of the PSC for Block 7 and clauses 5.1.21 and 18.6 of the PSC for Block 21, provide that the Consortium shall return the wells together with all equipment, tools, machinery, installations (acquired for and during the term of the PSCs) to Petroecuador in good condition except for normal wear and tear, and at no cost. These provisions provide precisely as follows:

> Block 7 PSC[1119]
>
> "5.1.22 Upon termination of this Contract, deliver the wells, property, installations, equipment and infrastructure works related to this Contract to PETROECUADOR, at no cost and in good condition, in accordance with the provisions of Article twenty-nine (29) of the Hydrocarbons Law."
>
> "**18.6** Upon the term of this Contract, either due to expiration of the Exploitation Period or for any other reason during the same Period, the Contractor shall deliver to PETROECUADOR, withouth cost and in good condition, the wells which were in production and, in good condition except for normal wear, all equipment, tools, machinery, installations and other items which were acquired for purposes of this Contract."
>
> Block 21 PSC[1120]
>
> "**5.1.21** Upon termination of the Contract, the Contractor shall deliver to PETROECUADOR, at no cost and in good condition, the wells, property, facilities, and equipment that were required for the purpose of the Contract in accordance with article 29 of the Law on Hydrocarbons."

1118 CE-CC-013.

1119 CE-CC-028.

1120 CE-CC-013.

> "**18.6** Upon termination of this Contract at the end of the Exploitation Period or for any other cause occurring during the same Period, the Contractor shall deliver to PETROECUADOR, at no cost and in good production conditions, the wells that are active at such time as well as, in good condition except for normal wear and tear, all other equipment, tools, machinery, facilities, and other movable and immovable property acquired for the purposes of this Contract."

918. It is also necessary to refer to Article 29 of the Hydrocarbon Law noted above which states:

> "[U]pon termination of an exploration and exploitation contract, due to expiration of its term or for any other reason arising during the exploitation period, the contractor or associate must turn over to PETROECUADOR, at no cost and in a good state of production, the oil wells that are in activity at the time; as well as, in good condition, all equipment, tools, machinery, installations, and other real or personal property that were acquired to fulfil the contract's purposes […]." [1121]

919. With regard to the obligation to comply with the generally accepted international petroleum industry's practices, it is important to note that Article 10 of RAOHE provides that the contractor "*shall apply, at least*" the API standard "*and any other rule or standard of the petroleum industry.*"[1122]

> "**Norms and Standards**:
> In hydrocarbon operations, PETROECUADOR and contractor shall apply, at least, the practices recommended by the American Petroleum Institute "API" particularly the following: "Exploration and Production standards" and "Manual of Petroleum Measurement standards" and any other rule or standard of the petroleum industry."

920. Furthermore, RAOHE does provide for specific standards in relation to infrastructure and contains several references to the API standards. It is not disputed between the Parties that the API standards combine preventative as well as predictive maintenance techniques.[1123]

1121 EL-90 (Unofficial translation from the Spanish original).

1122 EL-148.

1123 Perenco's Counter-Memorial on Counterclaims, paras 519-521 *c.f.* Ecuador's Reply on Counterclaims, paragraph 456.

921. As the *Burlington* tribunal noted, and as has occurred in the present case, both Parties challenge the credibility or relevance of each other's witnesses and experts. The Tribunal bears in mind that the witnesses gave evidence relating to matters occurring some years previously and in those circumstances, just like the *Burlington* tribunal,[1124] the Tribunal places more reliance on contemporary documents which may assist regarding the determination of the state of the infrastructure as of the date of takeover.

922. An important part of Perenco's defence to the infrastructure counterclaim was its reliance on two contemporaneous reports prepared by SGS in 2009 and 2010 ("**SGS Reports**").[1125] Both of these reports assess the condition of the infrastructure, which included the equipment facilities and other assets of both Blocks 7 and 21 according to five categories ranging from very good to very bad. These reports concluded that the significant majority of the infrastructure is considered to be in good or very good condition. This report seems to tie up with Ecuador's claim for compensation in *Burlington* with respect to only 3 tanks (out of 89) and 3 pumps (out of 16).[1126]

923. It is true that Ecuador invites the Tribunal to place little reliance on the SGS Reports on the grounds that they are no more than inventories of assets.[1127] The Tribunal disagrees as it places considerable reliance on the SGS Reports, especially where other evidence is lacking.

1124 See *e.g. Burlington* Decision on Counterclaims, paragraphs 933-936.

1125 CE-CC-217; CE-CC-240.

1126 Ecuador withdrew its claim for the purchase of 5 power oil pumps as those had not been acquired yet, see Ecuador's Reply on Counterclaims, para 519.

See CE-CC-348 (total number of tanks). Regarding Ecuador's claim with respect to tanks in the present case, see Montenegro WSI, para 23, bullet point 6: only tank repaired was the Payamino T-102 tank; Ecuador's Reply on Counterclaims, paras 521, 529: T-104 tank of Gacela CPF has been repaired, and emergency repairs carried out Payamino T-102 tank and the Yuralpa T-400 tank.

The Tribunal notes that Ecuador in its Resp. PHB CC, paragraph 112 seeks to explain that it is complaining that "*at least 12 tanks were returned in poor condition …, not 3 as wrongly alleged by Perenco*."

Regarding its claim with respect to pumps, see CE-CC-217, Amortizables B7 and Amortizables B21 (total number of pumps). Ecuador's claim is for (i) a new transfer and horizontal multistage pumps in the Oso and Gacela fields (Montenegro WSII, Annex 3, p. 4); (ii) repairs to two power oil pumps in the Coca field (Luna WS III, para 153; Luna WS III, Annexes 77-78; Ecuador's Reply on Counterclaims, paragraph 519).

1127 See Ecuador's Reply on Counterclaims, paragraphs 489, 491, 496. See also Luna WS III, paragraph 69.

924. Another important point to bear in mind as mentioned earlier, is that Petroamazonas expanded its operations and increased drilling and production on both Blocks from at least January 2010 onwards.[1128] As the *Burlington* tribunal remarked, and with which this Tribunal agrees, "*this expansion and increase in production would entail a need to improve the existing infrastructure.*"[1129] Ecuador has submitted before both tribunals that none of the amounts it is claiming is associated with the expansion of production in the Blocks. However, one thing is clear and that is that evidence of Petroamazonas' expansion activities do make it difficult to establish the facts as they were when the Consortium left the Blocks. The Tribunal needs to keep this in mind throughout.

925. At the end of the hearing on the counterclaims and after closing submissions thereon, the Tribunal, after careful deliberation, formed the view that Ecuador's claims in relation to the infrastructure counterclaim were excessive in value. The Tribunal formed the view that there were some breaches of the obligations, which sounded in damages, but in the light of all the evidence presented, the Tribunal was of the view that the damages were in the region of approximately US$2 million.

926. The Tribunal has read the *Burlington* award and finds itself in general agreement with the items of breach found by that tribunal regarding the infrastructure counterclaim. The *Burlington* tribunal considered the various items of that counterclaim in great detail and as their conclusions to a great extent accord with this Tribunal's view of the matter, no useful purpose can be served by a detailed recitation of evidence (virtually identical in both cases) and of the arguments relating to each head of claim. However, the Tribunal will set out briefly its reasoning and conclusions with regard to the disputed items.

1128 See Perenco's Counter-Memorial on Counterclaims, *e.g.* paragraphs 31, 376, 512 describing costs being claimed that are allegedly associated with Ecuador/Petroamazonas' expansion of the Blocks *c.f.* Ecuador's Reply on Counterclaims, Section 4.4.3, denying that it has included the costs associated with Petroamazonas' expansion of Block 7 but not denying that there are current plans for expansion in Block 7.

1129 *Burlington* Decision on Counterclaims, paragraph 937.

B. **Tanks**

927. Ecuador contends that the Consortium's practices of purchasing storage tanks which were substandard and of recycled parts of old tanks from several fields to build "*new*" tanks was not in line with international standards and requirements.[1130] Like the *Burlington* tribunal, this Tribunal is not satisfied that Ecuador has substantiated that the Consortium failed to construct or maintain tanks in accordance with industry standards and practices.

928. This Tribunal too relies upon the evidence of Dr. Egan that all the tanks were manufactured in accordance with API 650.[1131] There is evidence that the tanks were regularly inspected and records kept,[1132] that there was monitoring of corrosion of the tanks according to API 653, that there was an effective cathodic protection programme in place,[1133] that plans had been devised to repair the large tanks in the blocks and that the Consortium kept Ecuador apprised of tank repairs.[1134] This Tribunal also agrees that the fact that Ecuador limits its comments to a small percentage of the tanks and claims damages with respect to only 12 of them, is some indication that the Consortium's maintenance plan was, on the whole, adequate.

929. The Tribunal also notes Dr. Egan's point that inspections were carried out by Petroamazonas between one and three years after the takeover of the Blocks and that the type of corrosion identified by Petroamazonas was one that could occur quite quickly.[1135] This conclusion leads to some doubt as to whether the corrosion found was in fact due to insufficient maintenance by the Consortium and the Tribunal bears in mind that the burden of proof is on Ecuador. The Tribunal cannot be satisfied that the damage to the tanks, the subject of complaint, was caused by the Consortium's operations. It seems to the Tribunal more likely than not, that the tanks' condition deteriorated since Petroamazonas took

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1130 Ecuador's Reply on Counterclaims, paragraphs 500 and 501.

1131 Intertek I, paragraph 107.

1132 *Ibid.*, paragraph 117.

1133 *Ibid.*, paragraph 116.

1134 *Ibid.*, paragraph 119, referring to CE-CC-087, pp. 3-5.

1135 Intertek II, paragraphs 79-81, referring to Luna WS III, paragraph 65, discussing "*homogenous*" and "*localized*" types of corrosion.

control of the Blocks and this negates any liability on the part of the consortium. Accordingly, the Tribunal too is satisfied that Ecuador has not established that the Consortium breached its obligations to construct and maintain tanks according to industry standards.

930. Further, in addition to constructing and maintaining the tanks Ecuador alleges that the Consortium returned certain tanks in a condition that is not consistent with normal wear and tear.[1136] In its Post-Hearing Brief, Ecuador states that it seeks damages in relation to "at least 12 tanks [that were] returned in poor condition …, not 3 as wrongly alleged by Perenco."[1137] The Tribunal has reviewed the record and while, as noted above, Ecuador did comment on the alleged poor condition of 12 tanks, it has only provided details about the repairs works and costs for three specific tanks and so the Tribunal will briefly consider these three.

1. Gacela T-104 Tank

931. The documents provided show that this tank was inspected in 2010, 2011 and 2012.[1138] An inspection in December 2010 discovered some problems with the roof and found a high level of oxidation.[1139] The 2011 inspection showed that the corrosive processes had worsened and it was concluded that a "*complete replacement*" of the roof was "*required*."[1140]

932. When it had been inspected in December 2008 and again in April 2009, just months before the Consortium suspended operations, the roof was still in sufficiently good condition.[1141] Dr. Egan asserts that Ecuador failed to explain how the issues at the time of the inspections conducted between December 2010 and February 2012 were attributable to the Consortium. The issues complained of were only documented as "*new situations*" one and

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1136 See generally Ecuador's Reply on Counterclaims, Section 4.3.2.1.

1137 Resp. PHB CC, paragraph 112.

1138 Luna WS III, Annexes 55 to 57.

1139 *Ibid.*, Annex 55.

1140 *Ibid.*, Annex 56, pp. 6 and 7 (English translation).

1141 CE-CC-164; CE-CC-341.

a half years later, in December 2010.[1142] Dr. Egan also argued that it was entirely possible that the minimal corrosion identified in April 2009 rapidly progressed and became visible in December 2010; in fact, the December 2010 inspection indicated that the hole in the roof was "*new*."[1143]

933. Dr. Egan extrapolated from this that it was also in good condition in July 2009.[1144]

934. Contrary to the *Burlington* tribunal's finding, this Tribunal was persuaded by Dr. Egan's analysis given the close timing of the April 2009 inspection. While there may have been some incipient corrosion, the bulk of it appears to have occurred after the Consortium left the Block. The Tribunal believes that it is far more likely than not that the cause of the corrosion found cannot be attributable to the Consortium's operations.

935. The Tribunal can see no reason why Ecuador should be reimbursed for the costs that it claims.

2. Payamino T-102 Tank

936. Ecuador contends that inspections of this tank took place between 2010 and 2011 and to establish this it has provided a contract signed between Petroamazonas and Conduto to perform the repairs on tank T102 – mainly involving cleaning and painting the tank, both internally and externally.[1145] What is significant is that this document does not contain any description of the state of the tank at that time.

937. There is, however, documentary evidence prior to July 2009 which is contained in a document prepared by the Consortium in April 2008 in which it set out the basis for the bidding process to repair the Coca and Payamino tanks.[1146] This document establishes that in March 2008 this tank required further inspection and repair, but was not in a critical

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1142 Intertek II, paragraph 88, referring to Luna WS III, Annex 55.

1143 *Ibid.*, paragraph 89.

1144 *Ibid.*, paragraph 88.

1145 Montenegro WS 3, Annex 5.

1146 Solís WS 2, Annex 34.

condition at that time. The document stated that this tank should be cleaned and painted.[1147] The Consortium did develop a project plan with a proposed start date in October 2009 with the duration of some two months to conduct the necessary repairs, but by that time the Consortium was no longer operating the Blocks.[1148]

938. However, the point remains that had the Consortium continued to operate the Blocks they would have incurred the expense for which it had planned and in those circumstances the Tribunal can see no reason why Perenco should not bear the cost of these repairs which it would have borne if events had taken a different course.

939. Ecuador has claimed US$322,960.42, which it has clarified to be on account of the emergency repairs carried out on several fluid lines and pipelines, the Payamino T-102 tank, the Yuralpa T-400 tank, the Jaguar and Yuralpa camps, *etc*.[1149] The Tribunal agrees with the *Burlington* tribunal that Ecuador has not fully justified the claims for other repairs and improvements which are set out in Annex 3 to Mr. Montenegro's 2nd Witness Statement. The Tribunal further agrees with the *Burlington* tribunal that the amount recoverable under this head of claim should be reduced to US$210,130.76 which is the sum referable for the repairs made to this tank and pipelines.[1150]

3. Yuralpa T-400 Tank

940. In July 2009, the SGS Report described the condition of this tank as good or very good.[1151]

941. In relation to this tank, two inspections were carried out in March 2011. The first inspection suggested substantial repairs to the interior of the tank and identified certain problems which did not pose an immediate risk to the mechanical construction and integrity of the

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1147 Solís WS2, Annex 34, pp. 15-17 in the English translation.

1148 Intertek ER II, paragraph 93, referring to CE-CC-343.

1149 Ecuador's Reply on Counterclaims, paragraph 529.

1150 The Tribunal notes that the *Burlington* tribunal subtracted all items that manifestly do not relate to repairs done to Payamino Tank T-102 or pipelines, such as, inter alia, improvements done to the Jaguar camp's dining room and kitchen, or replacement of floors in the Yuralpa offices. (see fn. 1982 of Counterclaims Decision). The Tribunal agrees with this approach.

1151 CE-CC-217

tank.[1152] The second report found that there was no evidence of any problems that might put the mechanical construction and integrity at risk.[1153] It is also fair to point out that all references to this tank in the SGS Reports indicate that the tanks were in good or very good condition.[1154]

942. However, the biggest problem is that the first inspection which identified a defective condition of this tank dates from March 2011 which is some two years after the Consortium had ceased operations. Bearing in mind that the SGS Report in June 2009 describes the condition of the components of this tank in favourable terms, the Tribunal considers that Ecuador has failed to establish that any damage to this equipment and costs incurred relating to the condition of this equipment were caused by the Consortium. Consequently, this claim is dismissed.

C. **Claims relating to fluid lines and pipelines**

943. The *Burlington* tribunal addressed this matter in great detail between paragraphs 965 and 1006 of its Decision on Counterclaims. This Tribunal has considered these paragraphs carefully and has considered all the documents referred to therein, which were also submitted in this proceeding. This Tribunal agrees with the discussion and analysis conducted by the *Burlington* tribunal and can see no useful purpose in setting out this somewhat technical matter all over again.

944. The claim under this head is US$1,667,655.83. This is based on Mr. Luna's evidence, but the Tribunal notes, as did the *Burlington* tribunal, that in his last witness statement he assessed this claim at US$1,462,553.43 broken down in five component parts set out in paragraph 1005 of the *Burlington* Decision on Counterclaims.[1155] Bearing in mind that Ecuador is not seeking the replacement of the pipeline system, but has limited its claims to the cost of two inspections and urgent and necessary repairs as set out in the paragraph just

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1152 Luna WS III, Annex 52.

1153 *Ibid.*, Annex 53.

1154 CE-CC-217, SGS inventories of Blocks 7 and 21, July 2009.

1155 See Luna WS III, paragraphs 163-169.

referred to, this Tribunal agrees that Ecuador should be compensated in the sum of US$1,462,553.43.

D. **Claims related to generator engines**

945. This claim relates to various power generator engines in Blocks 7 and 21 which, it is alleged, were in a very bad state when the Consortium abandoned the blocks. Ecuador's claim focuses on Wartsila engines 2, 3 and 4 in Block 21 and on all 27 Caterpillar engines in Block 7. Ecuador's allegation is that the Consortium failed to conduct proper overhauls of these machines and further that it used harmful crude-diesel fuel mix in the Block 7 engines which caused damage to them. The claim here is based on the costs of overhauls, reduced engine life and the purchase of a new alternator for Wartsila engine 4. The total cost claimed hereunder is US$6,540,010.57 of which US$4,744,733.75 relates to Block 21 and US$1,795,276.18 relates to Block 7.

946. As to the claim in relation to overhauls it is not in dispute that engines require preventative maintenance which includes monitoring, testing and overhauls. However, having considered the evidence and in particular Mr. Luna's witness statements and Dr. Egan's expert report as well as the Consortium's maintenance records, this Tribunal agrees with the *Burlington* tribunal's reasoning - as set out between paragraphs 1021 and 1026 of the *Burlington* Decision on Counterclaims-, that Ecuador has failed to provide sufficient evidence of any alleged failure to perform timely overhauls to its generator engines or to prove that such failure increased the maintenance costs or reduced the useful life of the engines. Consequently, this claim is denied.

947. Ecuador also contends that damage was caused by the use of a crude-diesel fuel blend. This apparently was a cheaper diesel crude mix and Ecuador submits that the effect of this mix was disastrous on the engines. There is no dispute that the Consortium did use a crude-diesel fuel blend in Block 7, but Perenco contends that this was not an unreasonable choice

and it was one which had government approval and, in any event, had no lasting impact on the engines.[1156]

948. It is not contested that the Consortium decided to stop using this blend after approximately seven months. Mr. d'Argentré claimed that this was due to cost issues, but the Tribunal is not satisfied that cost was the sole reason and is entitled to infer that this was due, at least in part, because the blend was not properly working.

949. It is true that the Ministry of Mines and Petroleum knew of the practice of using this blend and that there was no opposition to it.[1157] Nevertheless, the Tribunal considers that the responsibility for the good condition of the equipment still lay with the Consortium. The documents provided to the Tribunal show that the use of the blend could lead to higher maintenance costs and affect engine life. Further, as has been stated, the Consortium itself discontinued the use of this blend.

950. For the above reasons and for those also stated in the *Burlington* Decision on Counterclaims on this issue, the Tribunal is satisfied that the use of the blend did affect the condition of the engines.

951. Ecuador claims a total of US$1,795,276.80 in connection with engines in Block 7 with US$1,123,800[1158] for the reduction in the engines' useful life, which Ecuador estimates to be a reduction of 30% in useful life,[1159] due to a lack of regular maintenance and the use of the crude diesel blend. However, as this Tribunal has already rejected Ecuador's contention that the Consortium's alleged lack of regular maintenance reduced engine life and as Ecuador has not satisfactorily established what proportion of the reduction in useful life can be attributed to the use of the blend, the Tribunal is left in somewhat of a quandary. The *Burlington* tribunal, in the exercise of its discretionary powers in matters of quantifying damages, thought it appropriate to grant Ecuador half of the amount claimed for reduction

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1156 Perenco's Counter-Memorial on Counterclaims, paragraphs 567-572.

1157 d'Argentré's WS III, paragraph 59, referring to Exh CE-CC-146.

1158 Ecuador's Supplemental Memorial on Counterclaims, paragraph 411.

1159 Ecuador's Reply on Counterclaims, paragraph 526.

of the useful life of Block 7 engines and thus granted a sum of US$561,900.[1160] This Tribunal is not bound to exercise its discretion in exactly the same way but considers it to be a reasonable sum and will grant US$561,900 under this head of claim.

E. Claims related to pumps, electrical systems, IT equipment, and road maintenance

1. Pumps

952. Ecuador alleges that the Consortium operated with too few pumps, and that those that were used were obsolete, did no preventative or predicted maintenance, had no or not sufficient back-up systems and lacked the necessary stock of spare parts.[1161] It alleges that when Petroamazonas took over the Blocks it had to purchase new pumps to replace the ones currently in place. However, there is no evidence that it ever replaced the pumps and at that time it had performed overhaul on pumps 2 and 4 of Coco CPF which it claimed costs of US$33,662.45.[1162]

953. This claim is unsustainable because for some time after taking over the Blocks Ecuador was still operating the pumps that it now claims are obsolete but for two pumps in Coca CPF. In relation to these two pumps Ecuador did perform overhauls at the cost set out above which is claimed here. As the *Burlington* tribunal remarked, the fact that 158 of 160 pumps were present in the Blocks when control passed to Petroamazonas in July 2009 and had not been overhauled or replaced after the takeover led that tribunal to infer that these pumps were not in the dire condition that Ecuador alleges.[1163] Having considered the matter afresh, this Tribunal agrees with the *Burlington* tribunal.

1160 *Burlington* Decision on Counterclaims, paragraph 1039.

1161 Luna WS III, paragraphs 123-129.

1162 See Ecuador's Reply on Counterclaims, paragraph 519, referring to Luna WS III, Annex 78.

1163 *Burlington* Decision on Counterclaims, paragraph 1044.

954. As for the two pumps which were overhauled, the report upon which Ecuador relies is dated September 2012, which was three years after Petroamazonas took over.[1164] This is of no assistance to the Tribunal in assessing the state of the pumps in July 2009.

955. This claim is dismissed.

2. Electrical systems

956. Similarly as the *Burlington* tribunal,[1165] the Tribunal dismisses the claim on the grounds of absence of proof that the expenses related to the purchase of the new variators were caused by the Consortium's improper maintenance or by bad condition beyond normal wear of the electrical system of the Blocks in July 2009.

3. IT equipment and software

957. The claim under this head is that the Consortium did not have proper maintenance software in accordance with industry standards. Accordingly, when Petroamazonas took over, it incurred costs in order to upgrade the technology used in its offices and implemented "Maximo" which was a new computerised maintenance management system (CMMS). Mr. Luna quantified this claim at US$151,601.96 which included the purchase of computers, cameras and the cost of hiring personnel to implement the system.[1166] If one excludes the purchase of computers, Ecuador quantifies this claim at US $81,384.96.[1167]

958. This claim for US$151,601.96 is not sustainable. The Consortium had another management software in place, the SAP system, which was characterized by Dr. Egan as an "*internationally recognized management system*"[1168] which is "*comprehensive*"[1169] and complying with industry standards.

1164 Luna WS III, Annex 79.

1165 *Burlington* Decision on Counterclaims, paragraphs 1049-1051.

1166 Ecuador's Supplemental Memorial on Counterclaims, paragraph 414.

1167 *Id.*

1168 Intertek ER I, paragraph 48.

1169 *Ibid.*, paragraph 51.

959. Ecuador does not dispute this, but contends that the Consortium did not give nor offer access to the SAP maintenance data when it left the Blocks and thus Petroamazonas had to purchase the Maximo system from scratch.[1170] While the *Burlington* tribunal placed reliance on a letter written by the Consortium to Petroamazonas on 23 July 2009 to "*propose a technical meeting to ensure an orderly post-takeover transition*", the letter was in fact referring to the transition of employees and contractors and not specifically the system. In all the circumstances, the Tribunal awards the sum of US$81,384.96.

F. Road maintenance and vehicles

960. Ecuador seeks to recover the amounts which it spent on the purchase of new vehicles (US$98,107.16) and road maintenance (US$381,127.64).[1171] The Tribunal notes that Ecuador has not put forward any documentary evidence showing the need to repair or replace specific vehicles. However, it notes that the SGS Reports do identify two vehicles, both Toyota Land Cruisers, that were either in "*very bad*" or "*good*" but damaged condition.[1172] The *Burlington* tribunal took the view that as Ecuador was claiming the cost of purchasing four similar vehicles for US$98,187.16, that tribunal should grant Ecuador half this claim, namely US$49,093.58. In this Tribunal's opinion, the fact that Ecuador has not put forward any documentary evidence supporting the need to repair or replace specific vehicles is sufficient for this claim to be dismissed. Accordingly, this Tribunal will not follow the *Burlington* tribunal which granted half the claim, namely, US$49,093.58.

961. The claim in respect of roads and road maintenance is dismissed for lack of proof that these expenses were caused by the Consortium's negligence.

1170 Luna WS III, paragraph 45, responding to Mr. d'Argentré's WS III, paragraph 36: "*Ecuador omits the fact that the Consortium was willing to transfer all of its maintenance records in an orderly fashion.*"

1171 E-211.

1172 CE-CC-217, CE-CC-240.

G. Other claims

962. Ecuador also seeks compensation for other repairs and the upgrade of facilities, the purchase of back-up equipment, spare parts and materials to bring the Blocks' operation into line with industry standards. These works include the reconditioning of wells, the refurbishment of camps and a new communication tower in Gacela CPF.[1173]

963. The Tribunal finds these claims have not been sufficiently particularised or proven by Ecuador. The Tribunal is satisfied that the infrastructure of the Blocks was generally in proper condition and that Ecuador's expansion plan and increases in production were likely to require improvements to existing equipment and facilities in any event. Accordingly, these additional claims are rejected.

H. Conclusion on the Damages Regarding the Infrastructure Counterclaim

964. For the reasons set out above, the Tribunal concludes that it will grant a total of US$2,315,969.15 in respect of Ecuador's infrastructure counterclaims itemised as follows:

(a) US$210,130.76 for the Payamino T-102 tank;

(b) US$1,462,553.43 for repairs related to pipelines and fluid lines;

(c) US$ 561,900 for generator engines; and

(d) US$81,384.96 for IT equipment and software.

965. The Tribunal now turns to the issue of double recovery. There is no dispute between the Parties that Ecuador can only recover this sum or receive the benefit of it once.[1174]

966. As Burlington and Ecuador have settled their differences by the payment in full of the *Burlington* award which included US$2,577,119 for Ecuador's infrastructure counterclaim (in other words, a deduction was made from Burlington's damages) it cannot be right for this Tribunal to award the same or part of the same sum twice. Therefore, consistent with

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1173 See *e.g.* Montenegro WS III, paragraph 7; see also E-211.

1174 See paragraph 907 above. Further, see generally Perenco's First and Second Dismissal Applications.

the agreement of Ecuador not to seek double recovery, this Tribunal concludes that because the *Burlington* infrastructure damages are higher than the sum awarded by this Tribunal, Ecuador has been made whole on the infrastructure counterclaim, and this sum shall not be included as part of Ecuador's counterclaim damages.

V. COSTS

967. As the procedural history of this arbitration shows clearly, these proceedings have been lengthy, complex, multi-faceted, hard fought and very expensive. The Parties filed their Submissions on Costs on 19 April 2019 and their Reply Submissions on Costs on 10 May 2019.

968. Perenco claims the total sum of US$57,923,332[1175] in respect of its legal costs and other expenses in this arbitration as set out in the Claimant's updated Schedule of Costs and Fees annexed to its 10 May 2019 Reply Submission on Costs.[1176]

Phase	Legal Fees	Expert Fees	Costs	Total
Request for Arbitration, Provisional Measures, Jurisdiction	$4,922,728	$225,986	$1,045,017	$6,193,731
Liability, Motion for Reconsideration	$6,619,023	$1,736,450	$1,551,189	$9,906,662
Quantum	$7,029,649	$5,115,861	$1,161,750	$13,307,260
Principal Claims	**$18,571,400**	**$7,078,297**	**$3,757,956**	**$29,407,653**
Counterclaims	**$11,881,356**	**$9,178,588**	**$3,005,809**	**$24,065,753**

1175 This amount excludes ICSID advance payments totalling US$4,799,900.00.

1176 Perenco in its Submission on Costs, dated 19 April 2019, originally claimed its total costs and fees of US$57,920,021.

969. Ecuador claims the total sum of US$31,620,369.27[1177] in respect of its legal costs and other expenses in this arbitration, and a total sum of US$49,629.76 in respect of Petroecuador's legal costs and other expenses in this arbitration. The detailed breakdown is set out in Annex A to its 19 April 2019 Costs Submission.

PHASE	LEGAL FEES (INCLUDING PGE)	EXPERT FEES AND COSTS	COSTS	TOTAL
Request for Arbitration, Provisional Measures, Jurisdiction	US$ 2,787,393.80	US$ 33,237.91	US$ 232,697.14	US$ 3,053,328.85
Liability, Motion for Reconsideration	US$ 4,212,798.50	US$ 1,058,867.79	US$ 480,065.83	US$ 5,751,732.12
Quantum	US$ 3,911,825.68	US$ 3,672,886.85	US$ 589,201.20	US$ 8,173,913.73
Principal Claims	**US$ 10,912,017.98**	**US$ 4,764,992.55**	**US$ 1,301,964.17**	**US$ 16,978,974.70**
Counterclaims	**US$ 5,284,433.84**	**US$ 3,859,326.13**	**US$ 991,719.98**	**US$ 10,135,479.95**

970. Both sides claimed their costs on the assumption they will be the prevailing party.

971. The starting point of any consideration for costs is Article 61(2) of the ICSID Convention which empowers the Tribunal to "except as the parties otherwise agree, assess the expenses incurred by the parties in connection with the proceedings, and decide how and by whom those expenses, the fees and expenses of the members of the Tribunal and the charges for the use of the facilities of the Centre shall be paid." The Tribunal has had to consider not only Perenco's Treaty claims but also claims of both Parties under the Participation Contracts, Ecuador's claims being in the form of counterclaims.

1177 This amount includes ICSID advance payments of US$4,500,000.00 and a PCA filing fee of US$5,914.62. It excludes Ecuador's final advance payment to ICSID of US$300,000 which was received after the submissions on costs. Ecuador has made ICSID advance payments totalling US$4,800,000.00.

972. The Participation Contracts provide that each Party shall incur the fees of the Arbitrator which they appointed, share half of the fees of the Presiding Arbitrator, and pay all the expenses incurred in the arbitration as determined by the Tribunal.

973. In its submissions, Perenco states that: "The Blocks 7 and 21 Participation Contracts provide a method of allocating costs that, with some exceptions, is generally consistent with the default rule under the ICSID Convention by giving the Tribunal discretion of allocating costs, except for arbitrator fees and costs of ICSID facilities."[1178] It however states that "[t]he contract claims . . . added few incremental costs to the Treaty claim" and that "[i]t is therefore not sensible to allocate the arbitrators' fees . . . according to the Participation Contracts."[1179] Ecuador agrees.[1180] In light of the Parties' agreement, the Tribunal will not apply the Participation Contracts' approach to the allocation of arbitrators' fees.

974. The Tribunal considers that tribunals usually take into account three factors in determining issues of costs.

i. First, the parties' success on their respective claims or counterclaims;

ii. Second, their procedural conduct throughout the arbitration; and

iii. Third, the reasonableness of the costs actually claimed by them.

975. It is well established that arbitrators in ICSID cases have a wide discretion and there is no rebuttable assumption as there is in other rules that costs should follow the event.

976. There are a number of features in this case which, it is argued by one Party or the other, have had an impact on the costs of these proceedings and which the Tribunal should take into account. The Tribunal will consider each in turn and give its decision as to whether

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1178 Perenco's Submission on Costs, paragraph 6.

1179 *Ibid.*

1180 Ecuador's Reply Submission on Costs, paragraph 2.

each has any merit and if so, whether it has a bearing on the award of the costs of these proceedings.

A. Ecuador declined to abide by the Tribunal's Decision on Provisional Measures

977. Perenco submits that Ecuador's decision not to abide by the Tribunal's Decision on Provisional Measures, dated 8 May 2009, vastly altered the face of this arbitration and added to its complexity, length and expense.[1181]

978. In paragraph 695 of its Decision on Liability, the Tribunal noted that:

> "The Tribunal recommended what it considered to be a reasonable way to protect both Parties' rights pending a final determination of their dispute. Regrettably, this was not possible in the circumstances. Perenco is correct to point out that had the State stayed its hand in relation to the *coactivas*, the dispute would not have been aggravated in the way in which it was."[1182]

979. Now that the case is at its end, the Tribunal, having reviewed the history of this dispute in the course of the final deliberations conducted in relation to the making of this Award, can go further. At the time when, despite the provisional measures, the Respondent threatened to proceed with the *coactivas*, the Tribunal made clear to Ecuador that the Tribunal "*must necessarily take a serious view of any failure to comply*"[1183] with its provisional measures determination. The Tribunal had given careful consideration to a means that would allow the Parties to continue with the arbitration without threatening the underpinnings of their contractual relationship and aggravating their dispute. The escrow account, which Perenco proposed and the Tribunal considered could reasonably do the job of protecting the Respondent's fiscal interests, would have had all contested Law 42 dues paid into an account and made payable to Ecuador if it prevailed on the merits. Regrettably, Ecuador

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1181 Perenco's Submission on Costs, paragraphs 3, 21-25.

1182 Decision on Liability, paragraph 695.

1183 *Ibid.*, paragraph 158, quoting from the Tribunal's letter of 27 February 2009 communicating its regret concerning the stance adopted by Ecuador with regard to Provisional Measures (Exhibit CE-204).

did not see fit to agree the escrow arrangement and instead commenced the *coactivas*.[1184] This led to a series of events culminating in the total breakdown in the Parties' relationship.

980. Irrespective of Ecuador's reasons for not complying with the Tribunal's Decision on Provisional Measures, the fact of the matter is that its refusal changed the nature of this arbitration to the detriment of Perenco. Had Ecuador complied, this arbitration would likely have been quite different;

(a) Perenco would likely still be operating both Blocks;

(b) With no *coactivas*, there likely would have been no suspension of operations, and hence no declaration of *caducidad*;

(c) The right to operate Block 7 would likely have been extended in a new contractual form on mutually acceptable terms;

(d) The Law 42 damages claim would have been relatively straightforward;

(e) The accounting evidence would have been far more straightforward;

(f) Both the liability and quantum phases would have been shorter and less expensive;

(g) There might well not have been a counterclaim as the post-termination provisions of the Participation Contracts would not have been engaged; as the continuing operator, Perenco would have had a commercial incentive to re-invest in infrastructure maintenance and environmental protection; had it not done so, Ecuador had sufficient contractual and statutory remedies to enforce the same;

(h) This arbitration would not have lasted 11 years;

(i) There would have been no need for over 50 submissions and seven hearings; and

(j) The total cost to both Parties would have been greatly reduced.

[1184] *Ibid.*, paragraph 170.

981. In the light of all of the above, the Tribunal considers that it is appropriate to take into account Ecuador's conduct in this arbitration when considering the overall issue of who should pay how much to whom.

B. Ecuador's objections to jurisdiction

1. The joining of Petroecuador to the proceedings

982. Perenco instituted these proceedings not only against Ecuador but also against Petroecuador. However, the Tribunal found that it had no competence over Petroecuador.[1185] Petroecuador claims as the reimbursement of the costs of its legal representation and expenses incurred US$49,629.76 in respect of this arbitration, with simple interest at a commercially reasonable rate from the date they were incurred until payment.[1186]

983. This sum is reasonable to the Tribunal and it will accordingly order Perenco to pay Petroecuador US$49,629.76, together with simple interest at an annual rate of 3% which shall accrue from 30 June 2011 (the date of dispatch of the Tribunal's Decision on Jurisdiction), until the date of full and final payment.

2. Objections to jurisdiction

984. Ecuador also raised objections to the Tribunal's jurisdiction to hear the claims. The Tribunal found it necessary to deal with the jurisdictional issues in two steps (issuing the Decision on Jurisdiction and then, after further evidence and submissions, the Decision on Liability). The Tribunal does not consider the objections to be frivolous and Ecuador's interest in having the Tribunal determine whether the principal claim could proceed was fully understandable. Nevertheless, ultimately Perenco prevailed on almost all jurisdictional issues except for the one relating to Petroecuador and the one relating to the claim regarding the declaration of *caducidad* in respect of Block 7 Contract. This will be taken into account in the award of costs.

1185 Decision on Jurisdiction, paragraph 242(3).

1186 Ecuador's and Petroecuador's Submission on Costs, paragraphs 8 and 41(a).

C. **Perenco received less than claimed**

985. Ecuador suggests that the Tribunal can take into account the fact that Perenco's claim was "grossly inflated."[1187] It is true that Perenco claimed US$1.423 billion (as of 18 April 2016, following some downward adjustments from US$1.698 billion) and ultimately was awarded US$448,820,400. The Tribunal notes that it is not uncommon for an award to be for a sum less than that claimed. The issue for the Tribunal is whether Perenco's claim was unreasonably inflated.

986. The principal reason for the lower award of damages is that the Tribunal could not agree with Perenco's contention that the damages should be calculated on the basis that that the Block 7 Participation Contract would have been extended. The decision to award damages only for the loss of opportunity of that possible extension led to a significant reduction in the amount payable to Perenco.

987. As for the calculation of the damages prior to the declaration of *caducidad*, in the end, the Tribunal took a different approach from that suggested by Professor Kalt, but it did not conclude that his approach and analysis were frivolous. The Tribunal decided to adopt the 'layering' approach which led to a lesser sum. Professor Kalt's views were not absurd nor fanciful. The Tribunal simply decided that a different approach led to a more appropriate but still substantial figure for damages.

988. For its part, Ecuador's quantum experts were instructed to base their assessment of damages on certain assumptions (not accepted by the Tribunal) that, with certain notable exceptions (such as the 'layering' approach to valuing damages resulting from different breaches occurring at different times, the 'true-up' and the Waterfall Chart), prevented their written reports prepared during the quantum phase of the proceeding from truly assisting the Tribunal. Based on these instructions, Professor Dow and his team came up with the surprising result that Perenco suffered no loss and in fact was indebted to Ecuador. No disrespect is intended to Brattle by the making of this observation. The problem was that during the initial part of the quantum phase, Brattle acted on instructions which did not

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[1187] Ecuador's Reply Submission on Costs, paragraph 5.

comport with the essential facts as found by the Tribunal, with predictable results in terms of the persuasiveness of their initial estimates of damages. In the end though, the Tribunal's view is that both Parties' experts provided helpful assistance to it.

989. Ecuador submitted a motion for reconsideration of the Tribunal's Decision on Liability which was dismissed by the Tribunal[1188] and Ecuador should bear Perenco's costs relating thereto. Perenco has not specified them separately but they have been included as part of the "Costs on Liability and Motion for Reconsideration." They are included in the sum awarded by the Tribunal to Perenco for its costs relating to the principal claim.

990. In view of the above, the Tribunal believes that Perenco is entitled to reimbursement of its costs in successfully pursuing its claims against Ecuador. However, the Tribunal is of the view that the reimbursement should be reduced to a reasonable level of these costs, taking into account in particular that not all expert evidence assisted the Tribunal in reaching its decision. Therefore, out of total costs of US$29,407,653 that Perenco incurred in relation to its "Principal Claims", the Tribunal decides that Ecuador shall reimburse Perenco US$23 million.

D. Ecuador's counterclaims against Burlington and Perenco

991. Burlington and Perenco were the joint and several contractors for both Blocks 7 and 21. They were referred to as "the Consortium" and Perenco managed the Blocks on behalf of the Consortium.

992. Both Burlington and Perenco commenced treaty claims against Ecuador (under different treaties) and contract claims under the same Participation Contracts. Burlington's Request for Arbitration was dated 21 April 2008 and Perenco's was dated 30 April 2008. Burlington, however, withdrew its contract claims on 6 November 2009.[1189]

1188 See Decision on Reconsideration.

1189 *Burlington Resources, Inc. v. Republic of Ecuador*, ICSID Case No. ARB/08/5, Decision on Jurisdiction, 2 June 2010, paragraphs 76-80.

993. In each of the arbitrations, Ecuador filed counterclaims seeking substantial compensation for environmental damage to parts of the Amazon rainforest affected by the works of, in effect, Perenco, as well as damages for the alleged failure to return the Blocks' infrastructure in reasonable condition as required by the Participation Contracts. Ecuador raised its counterclaims against Burlington on 17 January 2011 and then on 5 December 2011 raised the same counterclaims against Perenco.

994. The counterclaims raise three issues: (i) the question of duplication of proceedings; (ii) the initial estimation of the extent of the environmental damage; and (iii) the proportionality of what has actually been awarded to that which was initially claimed.

1. Duplication of proceedings

995. On 24 June 2011, counsel for Perenco wrote to the Respondent's counsel suggesting that considerable sums could be saved by Ecuador if it maintained counterclaims just in the *Burlington* proceedings, and went on to suggest ways in which this could be achieved.

996. On 29 June 2011, the Respondent rejected this suggestion, relying on the fact that both Burlington and Perenco had thought fit to institute their own proceedings and thus two counterclaims was the consequence. Perenco accepted this position; it did not see fit to oppose the Perenco counterclaim on admissibility[1190] or jurisdictional grounds and for some six years the Burlington and Perenco counterclaims proceeded along separate paths.

997. The issue thus arises whether Ecuador has unreasonably complicated these proceedings and thereby exacerbated the costs and delay by claiming the same damage from both Burlington and Perenco in two distinct arbitration proceedings. The counterclaim brought by Ecuador could have been maintained against Burlington alone or against Perenco alone. If the former, Perenco would be liable to compensate Burlington for 50% of any damages so proved as a joint and several co-contractor. If the latter, Burlington would be liable to compensate Perenco for 50% of any damages so proved as a joint and several co-contractor.

[1190] That is, at least up to two applications, dated 18 April 2017 and 30 January 2018, respectively, to dismiss the counterclaim on grounds of *res judicata.*

998. Has Ecuador attempted to have two bites of the same cherry?

999. The costs of the *Burlington* counterclaim hearing were substantial and led to an award in Ecuador's favour in the sum of almost US$42 million against a stated claim of US$2,797,007,091.42.[1191] The same claims were made against Perenco and, as will be seen above, has led to an Award in favour of Ecuador in the sum of US$93,683,890 from which the amount of US$39,199,373 awarded in the *Burlington* Decision on Counterclaims and paid by Burlington, has to be deducted, so as to avoid double recovery.[1192]

1000. Accordingly, the Tribunal needs to decide whether the counterclaims against Perenco has added to the costs because it could have only been dealt with in the *Burlington* proceedings.

1001. There is no doubt that the launching of two counterclaims based on the same subject-matter was calculated to increase Ecuador's overall chances of success. But as the Tribunal observed earlier, parallel investment treaty arbitral proceedings brought by claimants (sometimes in tandem with commercial claims concerning the same facts) have been found not to be abusive even if there might be an element seeking two bites of the same cherry.[1193]

1002. Indeed, to the extent that the counterclaims issues were the same in the two proceedings, the real question is why Ecuador would counterclaim against Burlington at all, given that Perenco was the operator, the party with first-hand knowledge of the operations, and therefore the actual (as opposed to the nominal) author of some of the contamination that the Tribunal's Independent Expert has found in the oilfields.

1003. If Ecuador had acted with a view to seeking relief in the most efficient way, Burlington would have been spared the costs of defending itself against the claims made against the actions of the Consortium's operator. But that ultimately plays no role in the assessment of costs in this proceeding. For the reasons just stated, Ecuador logically should have

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1191 *Burlington* award, in particular the Decision on Counterclaims, paragraph 52(iii), which is an integral part of the *Burlington* award.

1192 The remaining sum awarded by the *Burlington* tribunal has been treated as negativing any further award of damages for the infrastructure counterclaim.

1193 The *CME* and *Lauder* cases being a leading example.

proceeded against Perenco, not Burlington, and any costs thrown away in the *Burlington* arbitration are not relevant to assigning responsibility for costs in the present proceeding.

1004. The Tribunal has already held, by a majority, that under Ecuadorian and international law, Ecuador had a right to make counterclaims against both members of the Consortium and in its view, the exercise of that right by Ecuador was not abusive. This view was evidently shared by the *Burlington* tribunal, because it made no attempt to hold that its award on damages in favour of Ecuador had the effect of putting all extant counterclaims to an end. To the contrary, as already discussed, that tribunal left it to this Tribunal, as the later-in-time tribunal, to sort out the issue of double recovery.

1005. The Tribunal considers that launching the counterclaims in two proceedings was not necessary because as shown above it would have been possible to have them pursued just in one proceeding. But Ecuador stood on its rights, as it was entitled to do, and resisted Perenco's attempts to have the counterclaims consolidated.

1006. The Tribunal concludes that the maintenance of two counterclaims was an attempt (successful as it turned out) to have two bites at the cherry. It was an inefficient, costly and time-consuming way of obtaining a decision. But Ecuador had the right to commence two proceedings and no objection was taken by Perenco until it was far too late in the process.

2. The estimation of environmental damage

1007. As has been seen, the counterclaims against Perenco had a lengthy history. At the end of the hearing on the counterclaims, the Tribunal found that it was not prepared to accept the findings of either side's principal environmental experts and ordered an independent report by the Tribunal's Independent Expert, Mr. MacDonald, which led to an Award eventually in favour of Ecuador. Based upon the evidence then before it, the Tribunal believed that there would be contamination for which Perenco would be held liable[1194], and the amount of damages awarded has turned out to be substantial.

[1194] Interim Decision on Counterclaim, paragraph 582.

1008. The Tribunal has not lost sight of the fact that Perenco initially argued that the environmental counterclaims should be rejected "in its entirety and … costs [awarded] in its favour. . . [together with] such other and further relief as the Tribunal deemed just and proper."[1195]

1009. At the same time, also as anticipated by the Tribunal[1196], the sum awarded by the Tribunal is nowhere near what Ecuador originally claimed in the proceeding (quantified at US$2,279,544,559 for soil clean-up costs, US$265,601,700 for groundwater remediation costs and US$3,380,000 for further groundwater studies (subject to payment of compound interest from the date of the Award until the date of full payment).[1197]

1010. Given that Ecuador's counterclaims were for a sum well in excess of US$2.5 billion, Perenco had to take this very seriously indeed. The environmental counterclaim was heralded by exaggerated allegations of an environmental catastrophe. It was based on criteria that were divorced from the actual Ecuadorian legislative framework and using inflated *ex*-country remedial costs.

1011. At the same time, Perenco did itself no favours by seeking the dismissal of the counterclaim "*in its entirety*" and acknowledging only in the most grudging manner a minor environmental liability. While Ecuador's experts could be accused of "gold-bricking" the claim, Perenco's experts could be accused of "lead-bricking" it, finding at every turn an opportunity to ignore or reduce potential liability.

1012. In short, neither side's principal environmental expert gained the confidence of the Tribunal.[1198] For that reason, the Tribunal will direct that each side will bear the costs of its own environmental experts.

1195 *Ibid.*, paragraph 43.

1196 *Ibid.*, paragraph 593.

1197 *Ibid.*, paragraph 36.

1198 With the exception of Dr. Rouhani whose expert testimony the Tribunal found useful.

1013. At the end of the first counterclaims hearing, while it was not able fully to rely on Ecuador's evidence, the Tribunal considered that there was almost certainly some contamination for which Perenco would be responsible. Moreover, certain evidence of Perenco's own making was a matter of concern to the Tribunal.[1199] For this reason, the Tribunal encouraged the Parties to settle the environmental counterclaim based on the findings of fact and law that it had made in the Interim Decision on Counterclaim, while holding out the prospect that if they were unable to agree a settlement, an independent expert would be appointed. In the end, Ecuador benefited from this decision by being able to rely upon the Independent Expert's subsequent findings.[1200]

1014. Given that Ecuador ultimately prevailed on the environmental counterclaim, albeit with a much smaller award of damages than originally sought, it will be awarded a portion of its costs. The Award does not include Ecuador's expert fees and costs as its environmental expert reports did not assist the Tribunal in its task and it had to appoint the Independent Expert.

3. Disproportionality between what was claimed and what was awarded

1015. The *Burlington* tribunal awarded Ecuador the sum of US$41,776,492.77 in respect of its counterclaims.[1201] This Tribunal has awarded US$93,683,890 for the environmental counterclaim (and has held that the *Burlington* tribunal's award of infrastructure damages

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1199 The May 2010 "Jungal Memorandum": prepared by Perenco regarding the characterisation of the environmental issues in Payamino 2-8, when Perenco and a landowner but not the Ecuadorian authorities, had knowledge of the condition of a contaminated swampy area, and company officials debated what to do, being the leading example. The Interim Decision on Counterclaim, at paragraph 438, recounted the options set out in the memorandum:

438. The memorandum then set out "possible solutions" to the problem including, "conventional remediation" of the location, "confine the problem and justify leaving the area as it is", "dismiss the issue" (which it was noted could lead to a lawsuit and "multimillion dollars compensation" as well as lead the State to "force us to remedy the site under their conditions" in a situation where "the cost will reach amounts very difficult to estimate now" and "the reputational cost to Perenco will also be very high").

The memorandum added: "The State will probably assume that we are hiding many more [environmental] damages and will scrutinize the operations area in search for more damages and it will probably find them."

Quoted in the Interim Decision on Counterclaim, at paragraph 439.

1200 Even then, Ecuador persisted in characterising the situation in the Blocks as an environmental catastrophe, a characterisation which Perenco took exception to, and rightly so, in the Tribunal's view.

1201 See *Burlington* Decision on Counterclaims, paragraph 1099.B.

has already fully compensated Ecuador). There is accordingly a substantial mismatch between the amount claimed by Ecuador and the amount actually recovered. In the Tribunal's view, the counterclaims were overstated, in particular the environmental counterclaim, which was based upon a number of incorrect assumptions. The Tribunal is satisfied that the huge amount claimed by Ecuador in its counterclaims has added substantially to the costs of these proceedings. As has been noted above, the counterclaims would likely not have been raised had the Decision on Provisional Measures been honoured by Ecuador.

1016. Perenco's two Applications for Dismissal of Ecuador's Counterclaims failed[1202] and there is no reason why Perenco should not bear the costs relating thereto. They have not been specified by Ecuador separately but rather included in its costs relating to counterclaims. They are part of the costs which Perenco has to reimburse Ecuador in connection with the counterclaims.

1017. In view of the above considerations relating to the counterclaims and taking into account the outcome on the counterclaims reached, the Tribunal decides that Perenco shall reimburse Ecuador for the latter's costs incurred in relation to the counterclaims the amount of US$6,276,153.

E. Comments on Ecuador's costs submissions

1018. Finally, the Tribunal was somewhat surprised by the nature, tone and content of Ecuador's submissions on costs. Their analysis of these proceedings is in the opinion of the Tribunal not realistic.

1019. To state that Ecuador is in effect the prevailing party in this arbitration is simply untenable. Ecuador's submission that it is in fact the successful party and indeed the injured party in these proceedings is not accepted given the Tribunal's previous findings on the overall outcome of the proceeding.

[1202] See Decision on Perenco's First Dismissal Application and this Award, paragraph 514, above.

F. Costs of the Proceeding

1020. The costs of these proceedings, which have been paid out of the advances made by the Parties, are as follows:

(a) Arbitrators fees and expenses	US$ 2,720,449.19
(b) Environmental expert's fees and expenses[1203]	US$5,205,011.95
(c) ICSID's administrative fees	US$324,000.00
(d) Direct expenses (estimated)[1204]	US$1,254,592.59
TOTAL:	US$9,504,053.73

1021. The Tribunal, taking into account that Perenco prevailed on its principal claim, while Ecuador was successful with its counterclaims, and in the exercise of its discretion, decides that the costs of the proceedings, including those of the Tribunal's Independent Expert, shall be borne equally by the Parties.

[1203] This amount includes the estimated cost of US$10,000 for the removal of the investigation derived waste. The final waste disposal costs will be calculated once all the waste is weighed and disposed of pursuant to Ecuadorian law. The Tribunal has directed the Independent Expert to finalise arrangements with its local subcontractor to urgently dispose of such waste.

[1204] ICSID will provide a detailed final statement of the case account to the Parties. The remaining balance will be reimbursed to the Parties in proportion to the payments that they advanced to ICSID.

VI. DECISION

1022. The Tribunal incorporates by reference into this Award the Decision on Jurisdiction dated 30 June 2011, the Decision on Remaining Issues of Jurisdiction and on Liability dated 12 September 2014, the Decision on Ecuador's Reconsideration Motion dated 10 April 2015, the Interim Decision on the Environmental Counterclaim dated 11 August 2015, and the decisions on Perenco's two requests for dismissal of the Respondent's counterclaims dated 18 August 2017 and 30 July 2018.

1023. For the reasons set forth above, the Tribunal decides as follows:

(a) For the breaches of its obligations under the Participation Contracts and the Treaty, the Republic of Ecuador shall pay to Perenco Ecuador Limited the amount of US$448,820,400.00, comprising the net present values as of 2007 and 2010 plus prejudgment interest to 27 September 2019. To that amount, post-award interest will accrue at a rate of LIBOR for three-month borrowing plus two percent, compounded annually. Post-award interest will accrue from 1 December 2019 until the date of full and final payment;

(b) Perenco Ecuador Limited shall pay to the Republic of Ecuador the costs of restoring the environment in areas within Blocks 7 and 21 and remedying the infrastructure in these two Blocks in the amount of US$54,439,517.00. To that amount, post-award interest will accrue at a rate of LIBOR for three-month borrowing plus two percent, compounded annually. Post-award interest will accrue from 1 December 2019, until the date of full and final payment;

(c) The Republic of Ecuador shall pay to Perenco Ecuador Limited the amount of US$23,000,000.00 as contribution to Claimant's legal fees and costs related to the principal claim, together with simple interest at an annual rate of three percent, which shall accrue from 1 December 2019 until the date of full and final payment;

(d) Perenco Ecuador Limited shall pay to the Republic of Ecuador the amount of US$6,276,153.00 as contribution to Ecuador's legal fees and costs related to the

counterclaims, together with simple interest at an annual rate of three percent, which shall accrue from 1 December 2019 until the date of full and final payment;

(e) Perenco Ecuador Limited shall pay to Petroecuador the amount of US$49,629.76 in respect of the latter's legal fees and costs, together with simple interest at an annual rate of three percent which shall accrue from 30 June 2011 (the date of dispatch of the Tribunal's Decision on Jurisdiction) until the date of full and final payment;

(f) The ICSID costs (including the Tribunal's fees and expenses) shall be borne equally by both Parties;

(g) The costs of the Tribunal's Independent Expert shall be borne equally by both Parties; and

(f) All other claims of the Parties and requests for relief are dismissed.

Judge Peter Tomka
President of the Tribunal

23 SEPTEMBER 2019

Mr. Neil Kaplan, C.B.E., Q.C., S.B.S.
Arbitrator

16 SEPTEMBER 2019

Mr. J. Christopher Thomas, Q.C.
Arbitrator

10 SEPTEMBER 2019

ANNEX A

Table 1. Allocation of Remedial Responsibilities - Sites Where Perenco Used Mud Pits and/or Installed Crude Oil Production Wells

Site	Remedial Costs for Perenco Mud Pits	Remedial Costs for Soils			Remedial Costs for Groundwater	Total Allocation of Remedial Costs				Notes/Comments
		Predecessors	Perenco	Successors		Predecessors	Perenco	Successors	Total	
Coca 18/19	$ 3,123.00	$ 114.08	$ 291.92	$ -	$ -	$ 114.08	$ 3,414.92	$ -	$ 3,529.00	Soils around the Coca 18 well installed by Kerr McGee are affected by barium only. Thus, this affected area is not attributable to Perenco.
Condor N 1	$ 2,484.00	$ -	$ 6,339.00	$ -	$ -	$ -	$ 8,823.00	$ -	$ 8,823.00	
Jaguar 9	$ 541.00	$ -	$ -	$ -	$ -	$ -	$ 541.00	$ -	$ 541.00	
Lobo 3, 5, 6, 7	$ 101.00	$ -	$ -	$ -	$ -	$ -	$ 101.00	$ -	$ 101.00	
Oso 3-8, 13, 14	$ 1,906.00	$ -	$ -	$ -	$ -	$ -	$ 1,906.00	$ -	$ 1,906.00	
Oso 9, 12, 15-20	$ 5,317.00	$ -	$ -	$ -	$ 3,415.00	$ -	$ 8,732.00	$ -	$ 8,732.00	
Oso 9A	$ 2,948.00	$ -	$ -	$ -	$ -	$ -	$ 2,948.00	$ -	$ 2,948.00	
Oso 9B	$ 1,507.00	$ -	$ -	$ -	$ -	$ -	$ 1,507.00	$ -	$ 1,507.00	
Oso A, 21, 23	$ -	$ -	$ 228.00	$ -	$ -	$ -	$ 228.00	$ -	$ 228.00	Perenco installed 4 of the 16 wells (OSO-A 21, OSO-A 23, 22H and 22st). Based on the naming convention, all other wells (OSO-A 45, OSO-A 43, OSO-A 41, OSO-A 39, OSO-A 30, OSO-A 24, OSO-A 33, OSO-A 28, OSO-A 27, OSO-A 25, OSO-A 26, OSO-A 29, OSO-A 35) appear to have been installed after Perenco. Thus, the soil exceedances are attributed to Perenco given their detection shortly after Perenco's operatorship ended.
Payamino 16	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	See note 3.
Payamino WTS	$ 2,978.00	$ -	$ 1,194.40	$ 298.60	$ -	$ -	$ 4,172.40	$ 298.60	$ 4,471.00	Based on photographic documentation in the project record, there appears to be a post-Perenco use of a soil cell at the site (about 1/5 of the total area). 1/5 of the soil remedial costs are allocated to Perenco's successor and 4/5 to Perenco.
Yuralpa - Chonta	$ 1,404.00	$ -	$ 645.00	$ -	$ -	$ -	$ 2,049.00	$ -	$ 2,049.00	
Yuralpa - LF	$ 12,217.00	$ -	$ -	$ -	$ -	$ -	$ 12,217.00	$ -	$ 12,217.00	See note 4.
Yuralpa Pad A	$ 1,034.00	$ -	$ 202.00	$ -	$ -	$ -	$ 1,236.00	$ -	$ 1,236.00	
Yuralpa Pad B	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	See note 5.
Yuralpa Pad D	$ -	$ -	$ 475.00	$ -	$ -	$ -	$ 475.00	$ -	$ 475.00	Contamination detected in 2010. Two of the five wells were installed after 2009. Thhe soil exceedances are attributed to Perenco given their detection shortly after Perenco's operatorship ended.
Yuralpa Pad E	$ 193.00	$ -	$ -	$ -	$ -	$ -	$ 193.00	$ -	$ 193.00	
Yuralpa Pad F, CPF	$ -	$ -	$ 98.00	$ -	$ -	$ -	$ 98.00	$ -	$ 98.00	
Yuralpa Pad G	$ 963.00	$ -	$ -	$ -	$ -	$ -	$ 963.00	$ -	$ 963.00	
TOTAL	**$ 36,716.00**	**$ 114.08**	**$ 9,473.32**	**$ 298.60**	**$ 3,415.00**	**$ 114.08**	**$ 49,604.32**	**$ 298.60**	**$ 50,017.00**	

Notes

1. All costs in thousands of USD.

2. For these sites, allocated costs for soil and groundwater are provided and not included in Tables 2 and 3.

3. During the March 2019 hearing, Ecuador provided evidence indicating that Perenco had transferred to and disposed of mud pit materials from other sites at Payamino 16. Perenco did not dispute this. Considering that 85% of the Perenco mud pits did not conform to the performance criteria of RAOHE, the Tribunal considers it more likely than not that the mud pits at this site would not have conformed to RAOHE considering that Perenco's site operations did not differ during its tenure. The estimated remedial cost and allocation of responsibilities for mud pits at Payamino 16 is set out in Table 4.

4. Ecuador investigated groundwater at the Yuralpa Landfill, but the Independent Expert did not investigate groundwater at this site for logistical reasons. Considering that at least one well at every site has a detected exceedance of TPH and/or barium, it is reasonable to assume that groundwater at Yuralpa LF would be similarly affected considering that Perenco's site operations did not differ during its tenure. The estimated remedial cost and allocation of responsibilities for groundwater at the Yuralpa Landfill is set out in Table 4.

5. Perenco installed wells at Yuralpa B and used the mud pits at the site. Due to an oversight, Ramboll did not investigate the Perenco mud pits at this site. Considering that 85% of the Perenco mud pits did not conform to the performance criteria of RAOHE the Tribunal considers it more likely than not that the mud pits at this site would also not have conformed to RAOHE considering that Perenco's site operations did not differ during its tenure. The estimated remedial cost and allocation of responsibilities for mud pits at Yuralpa B are set out in Table 4.

6. Where necessary, clarifications on allocation are provided in the comments/notes.

Table 2. Allocation of Remedial Responsibilities - Sites with Affected Soil

Site	Time-based Allocation of Remedial Costs for Soil			Total	Notes/Comments
	Reference Date[2]	Predecessors	Perenco		
Coca 01	Jan-71	$ 644.73	$ 143.27	$ 788.00	
Coca 02, CPF	Dec-88	$ 2,266.68	$ 433.32	$ 2,700.00	The barium-affected area east of the non-Perenco mud pit is attributed to Perenco's predecessors. In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for one of the three remaining affectedareas.
Coca 04	Jan-90	$ 308.00	$ -	$ 308.00	The two barium-affected areas east of the platform are attributed to Perenco's predecessors.
Coca 06	Oct-89	$ 4,319.08	$ 903.92	$ 5,223.00	The two barium-affected areas southeast of the platform and upslope of the adjoining swampy area are attributed to Perenco's predecessors.
Coca 08	Oct-89	$ 10,055.00	$ -	$ 10,055.00	The barium and other metals affected areas west and south of the platform are attributed to Perenco's predecessors.
Coca 09	Jan-93	$ 805.00	$ -	$ 805.00	The barium-affected area northwest of the platform is attributed to Perenco's predecessors.
Coca 10, 16	Mar-91	$ 482.26	$ 298.74	$ 781.00	In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for the affected area.
Gacela 01, CPF	Feb-91 - Jun-95	$ 1,572.51	$ 530.49	$ 2,103.00	The barium-affected area adjacent to the southwest part of the platform is attributed to Perenco's predecessors. Perenco's contribution to the area with barium exceedances to the southeast of the platform could not be discounted as groundwater in this area is affected by TPH and TPH was detected in soils. In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for the remaining four affected areas.
Gacela 02	Jun-92	$ 1,336.21	$ 238.79	$ 1,575.00	The barium-affected area southwest of the platform is attributed to Perenco's predecessors. See note 4.
Gacela 04	Mar-94	$ 195.00	$ -	$ 195.00	The barium-affected area near the wellhead is attributed to Perenco's predecessors.
Gacela 05	Sep-94	$ 130.18	$ 116.82	$ 247.00	In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for the affected area.
Jaguar 01	Jan-88	$ 1,997.01	$ 1,106.99	$ 3,104.00	In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed full responsibility for the impact of TPH around the valve station, which were the result of an oil spill that reportedly occurred in 2005-2006, and partial responsibility for the swampy area downslope of the valve station. In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for the three affected areas.
Jaguar 02	Dec-88	$ 8,308.40	$ 196.60	$ 8,505.00	The barium (and other metals) affected areas northeast of the platform, west of the mud pit, and along the northern stream are attributed to Perenco's predecessors. For the areas with surficial crude resulting from a spill in 2006 (during Perenco's tenure), Perenco is entirely responsible. In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for two of the three remaining affected areas.
Jaguar 03	Jan-94	$ 3,604.24	$ 2,038.76	$ 5,643.00	The barium-affected ballast material is attributed to Perenco's predecessors. Perenco's contribution to the underlying isolated areas of isolated metal exceedances could not be discounted. In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for the affected area. See note 4.
Jaguar 05, CPF	Jan-96	$ 182.48	$ 196.52	$ 379.00	In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for the two affected areas.
Jaguar 07, 08	Feb-96	$ 323.00	$ -	$ 323.00	The barium and nickel-affected area is attributed to Perenco's predecessors. See note 4.
Lobo 01	Feb-89	$ 1,361.00	$ -	$ 1,361.00	The barium (and other metals)-affected area is attributed to Perenco's predecessors.
Lobo 04	Dec-00	$ 717.00	$ -	$ 717.00	The barium-affected area is attributed to Perenco's predecessors. See note 4.
Mono CPF	Jan-89 - Feb-96	$ 8,312.80	$ 7,460.20	$ 15,773.00	In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for the impact of TPH in the swampy area, which were the result of an oil spill that reportedly occurred in 2008. This area is also affected by barium. Perenco's contribution to the two areas with metals exceedances to the north and east of the CPF could not be discounted as groundwater in these areas is affected by TPH and TPH was detected in soils. Since production well installation dates span from 1989 to 1996, a weighted average date was used for the time-based allocation of remedial costs.
Mono Sur	Sep-96	$ 580.45	$ 700.55	$ 1,281.00	
Oso 01, CPF	Sep-70	$ 186.00	$ -	$ 186.00	The barium-affected area is attributed to Perenco's predecessors.

Table 2. Allocation of Remedial Responsibilities - Sites with Affected Soil

Site	Time-based Allocation of Remedial Costs for Soil			Total	Notes/Comments
	Reference Date[2]	Predecessors	Perenco		
Payamino 01, CPF	Nov-86 - Dec-91	$ 3,521.12	$ 1,224.88	$ 4,746.00	The barium and TPH-affected area within the former concrete pit are attributed to Perenco's predecessors as this feature was closed in 1997. The TPH affected area next to the power oil pump building is attributed to Perenco as the soil samples in the stained area were collected shortly after Perenco's operatorship. In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for the other two affected areas.
Payamino 02, 08	May-87 - Sep-92	$ 6,126.40	$ 9,189.60	$ 15,316.00	During the March 2019 hearing, Perenco indicated in its closing submissions that it would assume 60% of the responsibility for Payamino 2/8.
Payamino 03	Aug-87	$ -	$ 129.00	$ 129.00	The TPH-affected soil pile on the southern side of the platform is attributed to Perenco as this stockpile was first identified shortly after Perenco's operatorship. In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for the affected area.
Payamino 04, 14, 20, 24	Jul-88 - May-01	$ 2,404.72	$ 1,006.28	$ 3,411.00	The date of the reported spill to the northeast of the Payamino 4 platform could not be confirmed. The two barium-affected areas in Payamino 14 are attributed to Perenco's predecessors. Historical aerial photography suggests that the area to the southwest of the Payamino 4 platform was disturbed between 1989 and 1990 and between 2003 and 2013 and the initial sampling of this area was performed in 2012; thus, the time-based allocation for this area considers a duration of 21 years (2013-1990). Since production well installation dates span from 1988 to 1994, a weighted average date was used for the time-based allocation of remedial costs for all other areas.
Payamino 10	Mar-93	$ 313.00	$ -	$ 313.00	The barium-affected area is attributed to Perenco's predecessors.
Payamino 13	Oct-93	$ -	$ -	$ -	
Payamino 15	Dec-93	$ -	$ -	$ -	
Payamino 16	Nov-93	$ -	$ -	$ -	
Payamino 21	Oct-94	$ -	$ 155.00	$ 155.00	The TPH-affected area next to the power oil pump building is fully attributed to Perenco as the soil samples in the stained area were collected shortly after Perenco's operatorship. In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for the affected area.
Payamino 23	May-97	$ 743.93	$ 1,021.07	$ 1,765.00	For the affected area next to the non-Perenco mud pit there was a slope failure. In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for the affected area.
Punino	Dec-90	$ 75.46	$ 45.54	$ 121.00	In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for the affected area.
Nemoca	Dec-99	$ 143.54	$ 386.46	$ 530.00	In Annex I to Perenco's comments on the Independent Expert's Report, Perenco assumed partial responsibility for the affected areas.
	TOTAL	**$ 61,015.19**	**$ 27,522.81**	**$ 88,538.00**	

Notes

1. All costs in thousands of USD.

2. Time-based allocation assumes that releases to the environment that resulted in impact on soils at the time of the first production well installation and continued through 2009. For affected areas that could be attributed to CPF operations, the initial release was assumed to have occurred when the CPF was constructed.

3. Contributions to the affected areas from Perenco's successor were considered unlikely as (a) review of the evidence of Petroamazonas' spills and releases indicate that such releases were generally small, were addressed promptly and/or occurred away from areas identified by the Independent Expert as warranting remediation; (b) during implementation of Ramboll's site investigation activities, no evidence of recent releases was observed; and (c) the soil samples collected shortly after Perenco's operatorship serve as an environmental conditions baseline that largely exculpates Perenco's successor.

4. The comments/notes section indicate when exceptions to the allocation principles are applicable or to define responsible parties, particularly where multiple affected areas exist at a site.

Table 3. Allocation of Remedial Responsibilities - Sites with Affected Groundwater

Site	Time-based Allocation of Remedial Costs for Groundwater				Total[2]	Notes/Comments
	Reference Date[3]	Predecessors	Perenco	Successors		
Coca 02, CPF	Dec-88	$ 2,436.00	$ 232.65	$ 332.35	$ 3,001.00	The affected areas of groundwater next to the non-Perenco mud pit and the pre-Perenco formation water pit are attributed to Perenco's predecessors. In the swampy area to the southeast of the CPF, potential contributions by Petroamazonas to groundwater from continued use of the API separator cannot be discounted.
Gacela 01, CPF	Feb-91 - Jun-95	$ 458.99	$ 452.53	$ 485.48	$ 1,397.00	In the affected area of groundwater downstream of the API separator at Gacela 1/CPF, potential contributions by Petroamazonas to groundwater from continued use of the API separator cannot be discounted. For the groundwater to the southeast of the facility, the soil samples were collected shortly after Perenco's tenure and limit responsibility to Perenco and its predecessors.
Gacela 02	Jun-92	$ 352.61	$ 244.39	$ -	$ 597.00	
Jaguar 1	Jan-88	$ -	$ 438.00	$ -	$ 438.00	Perenco accepted full responsibility for the release associated with the valve box area in 2005/2006 (Annex I of its 22 Feb 2018 letter), which is the likely source of TPH in the swamp downslope.
Jaguar 2	Dec-88	$ 586.50	$ 586.50	$ -	$ 1,173.00	The affected area of groundwater next to the non-Perenco mud pit is attributed to Perenco's predecessors. For groundwater in areas with surficial crude resulting from a spill in 2006 (during Perenco's tenure), Perenco is considered entirely responsible.
Mono CPF	Jan-89 - Feb-96	$ 2,650.95	$ 2,379.05	$ -	$ 5,030.00	
Payamino 01, CPF	Nov-86 - Dec-91	$ 604.25	$ 399.03	$ 400.72	$ 1,404.00	In the affected area of groundwater impairment adjacent to the stream to the northwest of the Payamino 1/CPF, potential contributions by Petroamazonas to groundwater resulting from its continued use of the CPF cannot be discounted. For the affected area of groundwater in the catchment area to the west of the CPF, the soil samples were collected shortly after Perenco's tenure and limit responsibility to Perenco and its predecessors.
Payamino 02/08	May-87 - Sep-92	$ 1,737.20	$ 2,605.80	$ -	$ 4,343.00	During the March 2019 hearing, Perenco indicated in its closing materials that it would assume 60% of the responsibility for Payamino 2/8.
Payamino 04	Jul-88 - May-01	$ 1,112.43	$ 498.57	$ -	$ 1,611.00	The date of the reported spill to the northeast of the Payamino 4 platform could not be confirmed. Historical aerial photography suggests that the area to the southwest of the Payamino 4 platform was disturbed between 1989 and 1990 and between 2003 and 2013 and the initial sampling of this area was performed in 2012; thus, the time-based allocation for this area considers a duration of 21 years (2013-1990). Since production well installation dates span from 1988 to 1994, a weighted average date was used for the time-based allocation of remedial costs for the area northeast of the platform.
Payamino 13	Oct-93	$ 655.88	$ 510.13	$ -	$ 1,166.00	
Payamino 15	Dec-93	$ 655.88	$ 510.13	$ -	$ 1,166.00	
TOTAL		**$ 11,250.68**	**$ 8,856.76**	**$ 1,218.55**	**$ 21,326.00**	

Notes

1. All costs in thousands of USD.
2. Affected groundwater was identified at Oso 9 and the remedial estimate amounted to $3.415. Since Perenco installed production wells and used mud pits at Oso 9, the allocation of responsibility for this site is provided in Table 1.
3. Time-based allocation assumes that releases to the environment that resulted in groundwater impairment began at the time of the first production well installation and continued through 2009. For affected areas that could be attributed to CPF operations, the initial release was assumed to have occurred when the CPF was constructed.
4. Contributions from Perenco's successor were only considered for areas where releases could be the result of ongoing use of specific features associated with CPFs (e.g., affected areas downgradient from an API separator discharge).
5. Clarifications on allocation are provided in the comments/notes when exceptions to the allocation principles were applicable or to define responsible parties, particularly where multiple affected areas exist at a site.

Table 4. Remedial Estimates and Allocation of Remedial Responsibilities - Additional Sites

Site	Affected Media	Quantity	Units	Remedial Estimate		Allocation of Remedial Costs			Notes/Comments
				Low	High	Predecessors	Perenco	Successors	
Payamino 16	Mud Pits	$ 4,300	m3	$ 1,075	$ 1,709	$ 215 - 342	$ 860 - 1367	$ -	See notes 2 and 4.
Yuralpa B	Mud Pits	$ 30,800	m3	$ 3,004	$ 8,972	$ 451 - 1346	$ 2553 - 7626	$ -	See notes 3 and 4.
Yuralpa LF	Groundwater	$ 11,670	m2	$ 1,166	$ 1,990	$ -	$ 1166 - 1990	$ -	See notes 5 and 6.
	TOTAL			**$ 5,245**	**$ 12,671**	**$ 666 - 1688**	**$ 4579 - 10983**	**$ -**	

Notes

1. All costs in thousands of USD.

2. Oryx installed a well and closed a mud pit at the site in 1993. Th evidence is that mud pit material was disposed in 5 of 6 mud pits at Payamino 16. Perenco did not dispute this at the March 2019 hearing. Inthe absence of any data to indicate which RAOHE leachability criteria is not met (i.e., unlined or lined mud pits), a range of remedial costs was estimated. The estimated costs have been allocated 80% (Perenco) and 20% (non-Perenco).

3. During the March 2019 hearing, Ecuador noted that Perenco had installed wells at Yuralpa B and mud pit sampling should have been performed; Perenco did not dispute this. Perenco installed six of the seven wells at this site. The mud pit area has been estimated from available aerial photographs and in the absence of any data to indicate which RAOHE leachability criteria is not met (i.e., unlined or lined mud pits), a range of remedial costs was estimated. The allocation of this estimated cost has been based on the number of wells installed by Perenco (85%) versus non-Perenco (15%).

4. A range of remedial costs was estimated for mud pits. The low estimate considers that the mud pit does not conform to RAOHE's performance criteria for unlined pits, such that the remedy would consist of excavation of the mud pit material, lining of the mud pit and placement of the untreated material in the lined mud pit. The high cost estimate considers that the mud pit does not conform to RAOHE's performance criteria for lined pits, such that the remedy would consist of excavation of the mud pit material, treatment of the excavated materials, lining of the mud pit and placement of the treated material in the lined mud pit.

5. The well location at Yuralpa LF sampled by IEMS is over 40m from the mud pit disposal area, where leachability testing indicated barium exceedances above the lined mud pit criteria. The high reasonable prediction of groundwater contaminant migration from other sites indicates the potential for barium to migrate such distances.

6. A range of costs was estimated for groundwater remediation based on the surface area of mud pits to be remediated. The low estimate is based on the order of magnitude estimate, while the high estimate integrates the groundwater remedy (placement of reactive media for treatment of TPH impacted groundwater) with the remedy of the mud pits. The assumed affected groundwater at this site is fully attributed to Perenco, who constructed and used the mud pits.

Table 5. Summary of Allocations of Remedial Responsibilities

Site	Time-based Allocation of Remedial Costs				Total[2]	Notes/Comments
	Non-Perenco	Only Perenco	Perenco's Share	Predecessors'/ Successors' Share		
Coca 01	$ -	$ -	$ 143.27	$ 644.73	$ 788	
Coca 02, CPF	$ 3,408.80	$ -	$ 665.97	$ 1,626.23	$ 5,701	
Coca 04	$ 308.00	$ -	$ -	$ -	$ 308	
Coca 06	$ 2,679.11	$ -	$ 903.92	$ 1,639.97	$ 5,223	
Coca 08	$ 10,055.00	$ -	$ -	$ -	$ 10,055	
Coca 09	$ 805.00	$ -	$ -	$ -	$ 805	
Coca 10, 16	$ -	$ -	$ 298.74	$ 482.26	$ 781	
Coca 18/19	$ 114.08	$ 3,414.92	$ -	$ -	$ 3,529	
Condor N 1	$ -	$ 8,823.00	$ -	$ -	$ 8,823	
Gacela 01, CPF	$ 1,034.45	$ -	$ 983.02	$ 1,482.54	$ 3,500	
Gacela 02	$ 991.67	$ -	$ 483.18	$ 697.16	$ 2,172	
Gacela 04	$ 195.00	$ -	$ -	$ -	$ 195	
Gacela 05	$ -	$ -	$ 116.82	$ 130.18	$ 247	
Jaguar 01	$ -	$ 580.92	$ 964.07	$ 1,997.01	$ 3,542	
Jaguar 02	$ 8,894.90	$ 783.10	$ -	$ -	$ 9,678	
Jaguar 03	$ 1,128.60	$ -	$ 2,038.76	$ 2,475.64	$ 5,643	
Jaguar 05, CPF	$ -	$ -	$ 196.52	$ 182.48	$ 379	
Jaguar 07, 08	$ 323.00	$ -	$ -	$ -	$ 323	
Jaguar 9	$ -	$ 541.00	$ -	$ -	$ 541	
Lobo 01	$ 1,361.00	$ -	$ -	$ -	$ 1,361	
Lobo 3, 5, 6, 7	$ -	$ 101.00	$ -	$ -	$ 101	
Lobo 04	$ 717.00	$ -	$ -	$ -	$ 717	
Mono CPF	$ -	$ -	$ 9,839.26	$ 10,963.74	$ 20,803	
Mono Sur	$ -	$ -	$ 700.55	$ 580.45	$ 1,281	
Oso 01, CPF	$ 186.00	$ -	$ -	$ -	$ 186	
Oso 3-8, 13, 14	$ -	$ 1,906.00	$ -	$ -	$ 1,906	
Oso 9, 12, 15-20	$ -	$ 8,732.00	$ -	$ -	$ 8,732	
Oso 9A	$ -	$ 2,948.00	$ -	$ -	$ 2,948	
Oso 9B	$ -	$ 1,507.00	$ -	$ -	$ 1,507	
Oso A, 21, 23	$ -	$ 228.00	$ -	$ -	$ 228	
Payamino 01, CPF	$ 1,690.69	$ 16.10	$ 1,607.81	$ 2,835.40	$ 6,150	
Payamino 02, 08	$ -	$ -	$ 11,795.40	$ 7,863.60	$ 19,659	
Payamino 03	$ -	$ 129.00	$ -	$ -	$ 129	
Payamino 04, 14, 20, 24	$ 220.20	$ -	$ 1,504.84	$ 3,296.96	$ 5,022	
Payamino 10	$ 313.00	$ -	$ -	$ -	$ 313	
Payamino 13	$ -	$ -	$ 510.13	$ 655.88	$ 1,166	
Payamino 15	$ -	$ -	$ 510.13	$ 655.88	$ 1,166	
Payamino 16	$ -	$ -	$ -	$ -	$ -	See note 2.
Payamino 21	$ -	$ 155.00	$ -	$ -	$ 155	

Table 5. Summary of Allocations of Remedial Responsibilities

Site	Time-based Allocation of Remedial Costs				Total[2]	Notes/Comments
	Non-Perenco	Only Perenco	Perenco's Share	Predecessors'/ Successors' Share		
Payamino 23	$ -	$ -	$ 1,021.07	$ 743.93	$ 1,765	
Payamino WTS	$ -	$ 2,978.00	$ 1,194.40	$ 298.60	$ 4,471	
Punino	$ -	$ -	$ 45.54	$ 75.46	$ 121	
Nemoca	$ -	$ -	$ 386.46	$ 143.54	$ 530	
Yuralpa - Chonta	$ -	$ 2,049.00	$ -	$ -	$ 2,049	
Yuralpa - LF	$ -	$ 12,217.00	$ -	$ -	$ 12,217	See note 2.
Yuralpa Pad A	$ -	$ 1,236.00	$ -	$ -	$ 1,236	
Yuralpa Pad B	$ -	$ -	$ -	$ -	$ -	See note 2.
Yuralpa Pad D	$ -	$ 475.00	$ -	$ -	$ 475	
Yuralpa Pad E	$ -	$ 193.00	$ -	$ -	$ 193	
Yuralpa Pad F, CPF	$ -	$ 98.00	$ -	$ -	$ 98	
Yuralpa Pad G	$ -	$ 963.00	$ -	$ -	$ 963	
TOTAL	**$ 34,425.50**	**$ 50,074.04**	**$ 35,909.85**	**$ 39,471.62**	**$ 159,881**	

Notes

1. All costs in thousands of USD.
2. Estimated remedial cost and allocation of responsibilities for groundwater at Yuralpa Landfill and mud pits at both Payamino 16 and Yuralpa B are not included in this table and are provided in Table 4.

ANNEX B

SCHEDULE OF WITNESSES AND EXPERTS FOR INFRASTRUCTURE COUNTERCLAIM

Burlington v. Ecuador	***Perenco v. Ecuador***
Ecuador's witnesses for infrastructure claim ▪ Mr. Pablo Alberto Luna Hermosa[1205] *Petroamazonas* ▪ Mr. Manuel Solís[1206] *Petroamazonas* ▪ Mr. Marco Puente[1207] *Petroamazonas* ▪ Mr. Diego Montenegro[1208] *Petroamazonas* *Burlington's witnesses and experts for infrastructure claim* ▪ Mr. Wilfrido Saltos[1209] *Perenco Ecuador Limited* ▪ Mr. Eric d'Argentré[1210]	*Ecuador's witnesses for infrastructure claim* ▪ Mr. Pablo Alberto Luna Hermosa[1213] *Petroamazonas* ▪ Mr. Manuel Solís[1214] *Petroamazonas* ▪ Mr. Marco Puente[1215] *Petroamazonas* ▪ Mr. Diego Montenegro[1216] *Petroamazonas* *Perenco's witnesses and experts for infrastructure claim* ▪ Mr. Wilfrido Saltos[1217] *Perenco Ecuador Limited* ▪ Mr. Eric d'Argentré[1218]

1205 See paragraph 893 of *Burlington* Decision on Counterclaims: Burlington's expert Intertek and Ecuador's witness, Mr. Pablo Luna, explain in detail the contents of these standards with respect to building, maintaining and replacing upstream infrastructure in the hydrocarbon industry.

1206 See paragraph 894 of *Burlington* Decision on Counterclaims: Ecuador submits that the Consortium breached its obligation to invest in, maintain and return the infrastructure in good condition and in accordance with industry standards, by following a "run to failure" maintenance strategy. According to Mr. Solís, Perenco's maintenance policy was driven by an "obsession [...] with reducing costs and making only the most indispensable minimum investings", which "translated into a lack of operational safety."

1207 See *Burlington* Decision on Counterclaims, fn. 1895: "*Reply, ¶ 486, referring to: Puente WS1, ¶ 19.*"

1208 See *Burlington* Decision on Counterclaims, paragraph 937 & fn. 1943: "*R-PHB, ¶ 993, in reliance of testimony from Messrs. Montenegro and Luna, in particular Montenegro WS3, ¶ 19….*"

1209 See *Burlington* Decision on Counterclaims, paragraph 12.

1210 See *Burlington* Decision on Counterclaims, paragraph 913 & fn. 1908; paragraph 916: "All this evidence was further corroborated at the Hearing, during which Mr. D'Argentré explained how the equipment used in both Blocks was subject to 'intensive oversight' by the Government during the entire duration of the Consortium's operations."

1213 See Ecuador's Counter-Memorial on Liability and Counterclaims, paragraph 915.

1214 *Id.*

1215 See *e.g.* Ecuador's Reply on Counterclaims, paragraph 492, referring to Mr. Marco Puente's testimony.

1216 See Resp. CM Counter-Memorial on Liability and Counterclaims, paragraph 915.

1217 See Cl. PHB on CC, paragraph 112.

1218 See Perenco's Counter-Memorial on Counterclaims, paragraph 532.

Perenco Ecuador Limited ▪ Dr. Geoffrey R. Egan[1211] *Intertek* ▪ Mr. Alex Martinez[1212] *Burlington Resources Peru Ltd*	*Perenco Ecuador Limited* ▪ Dr. Geoffrey R. Egan[1219] *Intertek* ▪ Mr. Alex Martínez[1220] *Burlington Resources Peru Ltd*

1211 *Ibid*., paragraph 902- Ecuador seeking to dismiss the relevance and reliability of Dr. Egan's testimony.

1212 See *Burlington* Decision on Counterclaims, paragraph 12.

1219 See Perenco's Counter-Memorial on Counterclaims, paragraph 518.

1220 See Perenco's Post-Hearing Submission on Counterclaims, paragraph 112.

CENTRO INTERNACIONAL DE ARREGLO DE DIFERENCIAS RELATIVAS
A INVERSIONES
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CERTIFICADO

PERENCO ECUADOR LIMITED

C.

REPÚBLICA DEL ECUADOR

(CASO CIADI NO. ARB/08/6)

Por la presente certifico que los documentos adjuntos son copias auténticas de las versiones en español e inglés del Laudo del Tribunal de Arbitraje con fecha de 27 de septiembre de 2019.

Martina Polasek
Secretaria General Interina

Washington, D.C., 27 de septiembre de 2019

CENTRO INTERNACIONAL DE ARREGLO DE DIFERENCIAS RELATIVAS A INVERSIONES
WASHINGTON, D.C.

En el procedimiento de arbitraje entre

PERENCO ECUADOR LIMITED

Demandante

y

LA REPÚBLICA DEL ECUADOR

Demandada

Caso CIADI No. ARB/08/6

LAUDO

Miembros del Tribunal
S. E. Juez Peter Tomka, Presidente
Sr. Neil Kaplan, C.B.E., Q.C., S.B.S.
Sr. J. Christopher Thomas, Q.C.

Secretario del Tribunal
Sr. Marco Tulio Montañés-Rumayor

Fecha de envío a las Partes: 27 de septiembre de 2019

REPRESENTACIÓN DE LAS PARTES

En representación de Perenco Ecuador Limited:

Sr. Mark W. Friedman
Sra. Ina C. Popova
Sra. Floriane Lavaud
Sra. Laura Sinisterra
Sra. Sarah Lee
Debevoise & Plimpton LLP
919 Third Avenue
Nueva York, NY 10022
Estados Unidos de América

En representación de la República del Ecuador:

Procuraduría General del Estado
Dr. Íñigo Salvador Crespo – Procurador General del Estado (a partir de agosto de 2018); precedido por el Dr. Rafael Parreño Navas, Procurador General del Estado encargado (febrero 2018 – agosto 2018); y por el Dr. Diego García Carrión, Procurador General del Estado (abril 2008 – enero 2018).

Dra. Claudia Salgado Levy – Directora Nacional de Asuntos Internacionales y Arbitraje (a partir de agosto de 2018); precedida por la Dra. Blanca Gómez de la Torre (junio 2013 – julio 2018); precedida por la Dra. Christel Gaibor Flor (marzo 2012 – mayo 2013); precedido por el Dr. Francisco Grijalva (mayo 2011 – febrero 2012); precedido por el Dr. Álvaro Galindo (agosto 2008 – abril 2011); y precedido por el Dr. Carlos Venegas (abril 2008 – julio 2008).

Abg Nazaret Ramos – Subdirectora de Asuntos Internacionales (a partir de marzo de 2019); precedida por la Dra. Christel Gaibor (abril 2008 – febrero 2019).

Abg. Diana Moya Dávalos – abogada PGE (a partir de julio 2013).
Abg. Gary López Vélez – abogado PGE (junio 2017 – diciembre 2018).
Abg. Francisco Larrea – abogado PGE (marzo 2011 – junio 2013).
Abg. Gianina Osejo – abogada PGE (septiembre 2009 – mayo 2012).
Abg. Agustin Acosta – abogado PGE (mayo 2010 – junio 2011).
Abg. Francisco Paredes Balladares – abogado PGE (septiembre 2009 – enero 2011).
Dra. Claudia Salgado Levy – abogada PGE (abril 2008 – agosto 2009).

Prof. Eduardo Silva Romero
Sr. José Manuel García Represa
Sr. Philip Dunham
Sr. Alvaro Galindo
Sra. Maria Claudia Procopiak
Sra. Audrey Caminades
Sra. Gabriela González Giráldez
Dechert (Paris) LLP
32 rue de Monceau
75008 París, Francia

Profesor Pierre Mayer
20 rue des Pyramides
75001 París, Francia

ÍNDICE DE CONTENIDOS

ABREVIATURAS Y TÉRMINOS DE USO FRECUENTE

Acuerdo Transaccional	Acuerdo Transaccional entre Burlington y Ecuador, de 1 de diciembre de 2017
Audiencia sobre *Quantum*	Audiencia sobre *Quantum*
Brattle ER I	Informe Pericial del Grupo Brattle, preparado por Jemes Dow y Richard Caldwell, de 4 de mayo de 2015.
Brattle ER II	Informe Pericial del Grupo Brattle, preparado por Jemes Dow y Richard Caldwell, de16 de octubre de 2015.
CIADI o el Centro	Centro Internacional de Arreglo de Diferencias Relativas a Inversiones
Cierre *Quantum*	Audiencia de Cierre sobre *Quantum*, de 21 de abril 2016
Cl. PHB Q	Escritos de la Demandante Posteriores a la Audiencia sobre *Quantum*, de 29 de enero de 2016
Cl. Rep. M.	Réplica de la Demandante a la Demanda Reconvencional de la Demandada, de 12 de abril de 2012
Cl. Rep. PHB Q.	Escritos de Réplica de la Demandante Posteriores a la Audiencia sobre *Quantum* de 29 de febrero 2016
Combe WS II	Declaración Testimonial de Laurent Combe, de 19 diciembre de 2014
Combe WS III	Declaración Testimonial de Laurent Combe, de 24 de julio de 2015
Contestación	Contestación de Ecuador a la Segunda Solicitud de Perenco de Desestimación de las Reconvenciones de Ecuador, de 15 de marzo de 2018
Contratos de Participación/CPs	Contratos de Participación para los Bloques 7 y 21 (Anexo CE-17/CE-17/CE-CC-28: Bloque 7 and Exhibit CE-10/CE-CC-13: Bloque 21)
Convenio CIADI	Convenio sobre Arreglo de Diferencias Relativas a Inversiones entre Estados y Nacionales de Otros Estados de fecha 18 de marzo de 1965
Crick WS II	Declaración Testimonial de John Crick, de 19 de diciembre de 2014
Crick WS III	Declaración Testimonial de John Crick, de 24 de julio de 2015
d'Argentré WS IV	Declaración Testimonial de Eric d'Argentré, de 3 de julio de 2013

d'Argentré WS V	Declaración Testimonial de Eric d'Argentré, de 19 de diciembre de 2014
d'Argentré WS VI	Declaración Testimonial de Eric d'Argentré, de 24 de julio de 2015
Decisión Provisional sobre Reconvención	Decisión Provisional sobre la Reconvención Ambiental, de 11 de agosto de 2015
Decisión sobre Medidas Provisionales	Decisión sobre Medidas Provisionales, de 8 de mayo de 2009
Decisión sobre Jurisdicción	Decisión sobre Jurisdicción, de 30 de junio de 2011
Decisión sobre la Responsabilidad	Decisión sobre las Cuestiones Pendientes Relativas a la Jurisdicción y sobre la Responsabilidad
Decisión sobre la Solicitud de Desestimación	Decisión sobre la Primera Solicitud de Desestimación de Perenco
Decisión sobre Reconsideración	Decisión sobre la Solicitud de Reconsideración del Ecuador
Dúplica	Dúplica de Ecuador a la Segunda Solicitud de Perenco para Desestimar las Reconvenciones de Ecuador, de 26 de abril de 2018
Dúplica *Quantum*	Dúplica sobre *Quantum* de la Demandada, de 16 de octubre de 2015
Ecuador o el Demandado	Ecuador
GSI ER I	Informe Pericial GSI Environmental Inc., de 20 de septiembre de 2012
GSI ER I	Informe Pericial GSI Environmental Inc., de 12 de julio de 2013
Informe del Perito Independiente o Informe	Informe del Sr. Scott MacDonald, Perito Independiente, de 19 de diciembre de 2019
Informe Pericial Consolidado	Comentarios Anotados de las Partes sobre el Informe del Perito Independiente
Intertek I	Informe Pericial de Geoffrey R. Egan, Intertek, de 28 de septiembre de 2012

Intertek II	Informe Pericial de Geoffrey R. Egan, Intertek, de 3 de julio de 2013
JOAs	Novación del Acuerdo de Operación Conjunta (JOA) con respecto al Block 7, Cuenca Oriente, Ecuador, de fecha 12 diciembre de 2002 (Anexo CE-31) y Novación del Acuerdo de Operación Conjunta con respecto al Block 21, Cuenca Oriente, Ecuador, de fecha 12 diciembre 2001 (CE32)
Kalt ER III	Informe Pericial de Joseph P. Kalt, de 19 de diciembre de 2014
Kalt ER IV	Informe Pericial de Joseph P. Kalt, de 24 de julio de 2015
LA [CA] [EL]	Autoridad Legal [Demandante] [Demandada]
Las Partes	La Demandante y la Demandada
Loose ER VI	Informe Pericial de Hernan Perez Loose, de 19 de diciembre de 2014
Loose ER VII	Informe Pericial de Hernan Perez Loose, de 24 de julio de 2015
Luna WS III	Declaración Testimonial de Pablo Luna, de 22 de febrero de 2013
Memorial/Cl. Mem. Q	Memorial de la Demandante sobre *Quantum*, de 19 diciembre de 2014
Palacios WS I	Declaración Testimonial de Derlis Palacios, de 30 de noviembre de 2011
Palacios WS III	Declaración Testimonial de Derlis Palacios, de 23 de julio de 2012
Perenco o el Demandante	Perenco Ecuador Limited
Perito Independiente	Sr. Scott MacDonald, de Ramboll, nombrado Perito Independiente del Tribunal por la Resolución Procesal No. 16, de 6 de julio de 2016
Pinto WS I	Declaración Testimonial de Germánico Pinto, de 28 de noviembre de 2011

Pinto WS II	Declaración Testimonial de Germánico Pinto, de 25 de julio de 2012
Primera Solicitud de Desestimación	Primera Solicitud de la Demandante de Desestimación de las Reconvenciones, de 18 de abril de 2017
Reglas de Arbitraje	Reglas Procesales Aplicables a los Procedimientos de Arbitraje del CIADI (2006)
Réplica	Réplica de la Segunda Solicitud de Perenco de Desestimación de las Reconvenciones de Ecuador, de 5 de abril de 2018
Réplica *Quantum* /Cl. Rep. Q.	Réplica sobre *Quantum* de la Demandante, de 24 de julio de 2015
Resp. C-Mem. Q.	Memorial de Contestación de la Demandada sobre *Quantum*, de 4 de mayo de 2015
Resp. PHB CC	Escritos Posteriores a la Audiencia sobre Reconvenciones de la Demandada, de 6 de noviembre 2013
Resp. PHB Q.	Escritos Posteriores a la Audiencia sobre *Quantum* de la Demandada, de 29 de enero de 2016
Resp. Rep. PHB Q.	Réplica de la Demandada a Escritos Posteriores a la Audiencia sobre *Quantum*, de 29 de enero de 2016
RPS ER IV	Informe Pericial de RPS, de 4 de mayo de 2015
RPS ER V	Informe Pericial de RPS, de 16 de octubre de 2015
Saltos WS I	Declaración Testimonial de Wilfrido Saltos, de 28 de septiembre de 2012
Segunda Solicitud de Desestimación	Segunda Solicitud de Perenco de Desestimación de las Reconvenciones de Ecuador, de 30 de enero de 2018
Solicitud de Arbitraje	Solicitud de Arbitraje de la Demandante, de 30 de abril de 2008
Solicitud de arbitraje modificada	Solicitud de arbitraje solicitada de la Demandante de 18 de julio de 2018
Strickland ER I	Informe Pericial de Richard F. Strickland, de 19 de diciembre de 2014

Strickland ER II	Informe Pericial de Richard F. Strickland, de 24 de julio de 2015
TBI o el Tratado	Tratado Bilateral de Inversión; Acuerdo entre el Gobierno de la República Francesa y el Gobierno de la República del Ecuador para la Promoción y la Protección Recíproca de Inversiones
Tr. (día) (MacDonald) (fecha) [página:línea]	Transcripción de la Audiencia sobre el Perito Independiente, de 11-12 marzo 2019
Tr. [J.] [P.M.] [M.] [página:línea]	Transcripción de la Audiencia sobre Jurisdicción / Medidas Provisionales/ Audiencia sobre Fondo
Tr. Q. (6) [página:línea]	Transcripción de la Audiencia de Cierre sobre *Quantum*, de 21 de abril de 2016
Tr. Q. (día) [página:línea]	Transcripción de la Audiencia sobre *Quantum*, de 9-13 noviembre 2015

I. INTRODUCCIÓN

A. Partes

1. La Demandante es Perenco Ecuador Limited y en lo sucesivo será denominada "**Perenco**" o la "**Demandante**".

2. La Demandada es la República del Ecuador y en lo sucesivo será denominada "**Ecuador**" o la "**Demandada**".

3. La Demandante y la Demandada se denominarán colectivamente las "**Partes**". Los representantes respectivos de las Partes y sus direcciones se detallan en la página (i) *supra*.

B. Antecedentes Procesales

4. El 30 de junio de 2011, el Tribunal emitió su Decisión sobre Jurisdicción ("**Decisión sobre Jurisdicción**").

5. El 12 de septiembre de 2014, el Tribunal emitió su Decisión sobre las Cuestiones Pendientes Relativas a la Jurisdicción y sobre la Responsabilidad ("**Decisión sobre la Responsabilidad**").

6. El 26 de noviembre de 2014, el Tribunal emitió la Resolución Procesal No. 12, mediante la que estableció el calendario para la etapa de *quantum*.

7. De conformidad con el calendario establecido, el 19 de diciembre de 2014, la Demandante presentó su Memorial sobre *Quantum* ("**Memorial"**). Dicho Memorial estaba acompañado de las declaraciones testimoniales de los Sres. Didier Lafont, Laurent Combe, John Crick, Rodrigo Márquez Pacanins y François Perrodo (segundas declaraciones testimoniales) y del Sr. Eric d'Argentré (quinta declaración testimonial); así como de los informes periciales del Dr. Richard Strickland (primer informe pericial), del Profesor Joseph P. Kalt (tercer informe pericial) y del Dr. Hernán Pérez Loose (sexto informe pericial).

8. El 10 de marzo de 2015, el Tribunal emitió la Resolución Procesal No. 13, en la que trató la solicitud de exhibición de documentos de la Demandada.

9. El 10 de abril de 2015, el Tribunal emitió su Decisión sobre la Solicitud de Reconsideración del Ecuador ("**Decisión sobre Reconsideración**").

10. El 4 de mayo de 2015, la Demandada presentó su Memorial de Contestación sobre *Quantum* ("**Contestación"**), acompañado de las declaraciones testimoniales de los Sres. Christian Dávalos (quinta declaración testimonial) y Gabriel Freire (primera declaración testimonial); así como de los informes periciales del Profesor Juan Pablo Aguilar (sexto informe pericial), de The Brattle Group (segundo informe pericial) y de RPS (cuarto informe pericial).

11. El 12 de junio de 2015, el Tribunal emitió la Resolución Procesal No. 14, en la que trató la solicitud de exhibición de documentos de la Demandante.

12. El 24 de julio de 2015, la Demandante presentó su Réplica sobre *Quantum* ("**Réplica *Quantum***"), acompañada de las declaraciones testimoniales de los Sres. Laurent Combe, John Crick y Rodrigo Márquez Pacanins (terceras declaraciones testimoniales), y del Sr. Eric d'Argentré (sexta declaración testimonial); así como de los informes periciales del Dr. Richard Strickland (segundo informe pericial), del Profesor Joseph P. Kalt (cuarto informe pericial) y del Dr. Hernán Pérez Loose (séptimo informe pericial).

13. El 11 de agosto de 2015, el Tribunal emitió su Decisión Provisional sobre la Reconvención Ambiental ("**Decisión Provisional sobre Reconvención**").

14. El 16 de octubre de 2015, la Demandada presentó su Dúplica sobre *Quantum* ("**Dúplica *Quantum***"), acompañada de los informes periciales del Profesor Juan Pablo Aguilar (séptimo informe pericial), de The Brattle Group (tercer informe pericial) y de RPS (quinto informe pericial).

15. El 23 de octubre de 2015, el Tribunal emitió la Resolución Procesal No. 15 relativa a la organización de la audiencia sobre q*uantum*.

16. La audiencia sobre *quantum* fue celebrada en París entre el 9 y el 13 de noviembre de 2015 ("**Audiencia sobre *Quantum***"). Las siguientes personas estuvieron presentes en la audiencia:

Tribunal

S. E. Juez Peter Tomka	Presidente
Sr. Neil Kaplan C.B.E., Q.C., S.B.S.	Coárbitro
Sr. J. Christopher Thomas Q.C.	Coárbitro

Asistentes de los Miembros del Tribunal

Sra. Lucille Kante	Asistente del Sr. Neil Kaplan C.B.E., Q.C., S.B.S.
Sra. Emily Choo Wan Ning	Asistente del Sr. J. Christopher Thomas Q.C.

Secretariado del CIADI

Sr. Marco Tulio Montañés-Rumayor	Secretario del Tribunal

En representación de la Demandante

Abogados

Sr. Mark W. Friedman	Debevoise & Plimpton LLP
Sra. Ina C. Popova	Debevoise & Plimpton LLP
Sr. Thomas H. Norgaard	Debevoise & Plimpton LLP
Sra. Terra L. Gearhart-Serna	Debevoise & Plimpton LLP
Sra. Z.J. Jennifer Lim	Debevoise & Plimpton LLP
Sra. Laura Sinisterra	Debevoise & Plimpton LLP

Personal de Apoyo

Sra. Prasheela Vara	Debevoise & Plimpton LLP
Sr. Sébastien Darid	Debevoise & Plimpton LLP
Sr. Gaspard de Monclin	Debevoise & Plimpton LLP
Sra. Sarah Lee	Facultad de Derecho de la Universidad de Harvard

Partes

Sr. Roland Fox	Perenco
Sr. François Hubert Marie Perrodo	Perenco

Testigos

Sr. Laurent Combe	Perenco
Sr. John Crick	Perenco
Sr. Eric d'Argentré	Perenco
Sr. Didier Lafont	Petroceltic
Sr. Rodrigo Márquez Pacanins	MQZ Renewables
Sr. François Hubert Marie Perrodo	Perenco

Peritos

Prof. Joseph P. Kalt	Compass Lexecon
Sr. Stephen Makowka	Compass Lexecon
Dr. Hernán Pérez Loose	Coronel y Pérez Abogados
Dr. Richard F. Strickland	The Strickland Group

En representación de la Demandada

Partes	
Dr. Procurador Diego Carrión García	Procuraduría General del Estado
Dra. Blanca Gómez de la Torre	Procuraduría General del Estado
Sra. Diana Moya	Procuraduría General del Estado
Abogados	
Prof. Eduardo Silva Romero	Dechert (París) LLP
Prof. Pierre Mayer	-
Sr. José Manuel García Represa	Dechert (París) LLP
Sr. Timothy Lindsay	Dechert (París) LLP
Sra. María Claudia Procopiak	Dechert (París) LLP
Sra. Gabriela González Giráldez	Dechert (París) LLP
Sr. David Attanasio	Dechert (París) LLP
Sra. Mónica Garay	Dechert (París) LLP
Sr. Antonio Gordillo	Dechert (París) LLP
Sra. Ruxandra Esanu	Dechert (París) LLP
Sra. María Quijada	Dechert (París) LLP
Sra. Katherine Marami	Dechert (París) LLP
Sra. Djamila Rabhi	Dechert (París) LLP
Sra. Peggy Alvarez Varas	Dechert (París) LLP
Sra. Sara María Moreno Sánchez	Dechert (París) LLP
Sra. Verena Wieditz	Dechert (París) LLP
Sra. Antonia Pascali	
Testigos	
Sr. Christian Dávalos	Testigo
Sr. Gabriel Freire	Testigo
Peritos	
Sr. Juan Pablo Aguilar	Universidad San Francisco de Quito
Sr. Gene Wiggins	RPS Knowledge Reservoir
Sr. Sheldon Gorell	RPS Knowledge Reservoir
Prof. James Dow	The Brattle Group
Sr. Richard Caldwell	The Brattle Group
Sr. Tom Dorrington Ward	The Brattle Group

17. El servicio de interpretación entre los idiomas español e inglés estuvo disponible. Asimismo, se realizaron grabaciones de audio y transcripciones estenográficas en tiempo real de la audiencia tanto en español como en inglés. Las copias de las grabaciones de audio y de las transcripciones fueron distribuidas a las Partes.

18. Al cierre de la Audiencia sobre Q*uantum*, el Tribunal y las Partes discutieron sobre las cuestiones procesales posteriores a la audiencia. Luego de consultar a las Partes, el Tribunal

estableció un calendario para las presentaciones posteriores a la audiencia, con inclusión de una audiencia sobre alegato de clausura.

19. El 29 de enero de 2016, las Partes presentaron sus Escritos Posteriores a la Audiencia ("**PHBs"**) de conformidad con la Resolución Procesal No. 15.

20. El 29 de febrero de 2016, las Partes presentaron sus Escritos de Réplica Posteriores a la Audiencia ("**Réplica PHBs**").

21. El 21 de abril de 2016, se celebró una audiencia sobre alegatos de clausura en la Haya ("**Cierre *Quantum***"). Las siguientes personas estuvieron presentes en la audiencia:

Tribunal

S. E. Juez Peter Tomka	Presidente
Sr. Neil Kaplan C.B.E., Q.C., S.B.S.	Coárbitro
Sr. J. Christopher Thomas Q.C.	Coárbitro

Asistentes de los Miembros del Tribunal

Sra. Lucille Kante	Asistente del Sr. Neil Kaplan C.B.E., Q.C., S.B.S.
Sra. Emily Choo Wan Ning	Asistente del Sr. J. Christopher Thomas Q.C.

Secretariado del CIADI

Sr. Marco Tulio Montañés-Rumayor	Secretario del Tribunal

En representación de la Demandante

Abogados	
Sr. Mark W. Friedman	Debevoise & Plimpton LLP
Sra. Ina C. Popova	Debevoise & Plimpton LLP
Sra. Z.J. Jennifer Lim	Debevoise & Plimpton LLP
Sra. Laura Sinisterra	Debevoise & Plimpton LLP
Personal de Apoyo	
Sra. Mary Grace McEvoy	Debevoise & Plimpton LLP
Partes	
Sr. Roland Fox	Perenco

En representación de la Demandada

Partes	
Dr. Procurador Diego Carrión García	Procuraduría General del Estado
Dra. Blanca Gómez de la Torre	Procuraduría General del Estado
Sra. Diana Moya	Procuraduría General del Estado
Abogados	
Sr. Eduardo Silva Romero	Dechert (París) LLP
Sr. Pierre Mayer	

Sr. Philip Dunham	Dechert (París) LLP
Sr. José Manuel García Represa	Dechert (París) LLP
Sra. María Claudia Procopiak	Dechert (París) LLP
Sr. David Attanasio	Dechert (París) LLP
Sra. Ruxandra Esanu	Dechert (París) LLP
Perito	
Sr. Richard Caldwell	The Brattle Group

22. El 6 de julio de 2016, el Tribunal emitió la Resolución Procesal No. 16 sobre el nombramiento del Sr. Scott MacDonald como el perito independiente del Tribunal ("**Perito Independiente**") en conformidad con su Decisión Provisional sobre la Reconvención.

23. Entre el 1 y el 5 de noviembre de 2016, las Partes y el Perito Independiente visitaron el lugar al que se refiere la controversia relativa a la reconvención ambiental de conformidad con la Regla 37(1) de las Reglas de Arbitraje del CIADI.

24. El 18 de abril de 2017, Perenco presentó una solicitud para que se desestimen las reconvenciones ("**Primera Solicitud de Desestimación**").

25. El 23 de mayo de 2017, Ecuador presentó sus observaciones respecto de la Primera Solicitud de Desestimación de Perenco.

26. El 12 de junio de 2017, Perenco presentó una réplica sobre su Primera Solicitud de Desestimación.

27. El 4 de julio de 2017, Ecuador presentó una dúplica sobre la Primera Solicitud de Desestimación de Perenco.

28. El 18 de agosto de 2017, el Tribunal emitió su Decisión sobre la Primera Solicitud de Desestimación de Perenco ("**Decisión sobre la Solicitud de Desestimación**").

29. El 30 de enero de 2018, Perenco presentó una segunda solicitud para que se desestimen las reconvenciones ("**Segunda Solicitud de Desestimación**").

30. El 15 de marzo de 2018, Ecuador presentó sus observaciones respecto de la Segunda Solicitud de Desestimación de Perenco ("**Contestación**").

31. El 5 de abril de 2018, Perenco presentó una réplica de su Segunda Solicitud de Desestimación (**Réplica**).

32. El 27 de abril de 2018, Ecuador presentó una dúplica sobre la Segunda Solicitud de Desestimación de Perenco (**Dúplica**).

33. El 30 de julio de 2018, el Tribunal informó a las Partes su decisión, por una mayoría, de rechazar la Segunda Solicitud de Desestimación de Perenco, y aclaró que proporcionaría las razones en las que se funda dicha decisión en el Laudo.

34. El 19 de diciembre de 2018, el Perito Independiente emitió su informe ("**Informe del Perito Independiente"** o **"Informe**").

35. El 20 de diciembre de 2018, Perenco presentó una solicitud ante el Tribunal a fin de que este último emitiera una decisión sobre la exhibición de documentos.

36. El 2 de enero de 2019, Ecuador presentó observaciones respecto de la solicitud de Perenco de que el Tribunal decida sobre la exhibición de documentos.

37. El 15 de enero de 2019, el Tribunal emitió la Resolución Procesal No. 17 en la que trató la exhibición de documentos.

38. El 6 de febrero de 2019, el Tribunal emitió la Resolución Procesal No. 18 en la que trató la organización de la audiencia.

39. El 23 de febrero de 2019, las Partes presentaron sus observaciones al Informe del Perito Independiente.

40. Entre el 11 y el 12 de marzo de 2019, se celebró en La Haya una audiencia sobre el Informe del Perito Independiente ("**Audiencia Pericial"**). Las siguientes personas participaron en dicha audiencia:

Tribunal

S. E. Juez Peter Tomka	Presidente
Sr. Neil Kaplan C.B.E., Q.C., S.B.S.	Coárbitro
Sr. J. Christopher Thomas Q.C.	Coárbitro

Asistente

Sra. Emily Choo Wan Ning	Asistente del Sr. J. Christopher Thomas Q.C.

Perito Independiente del Tribunal	
Sr. Scott MacDonald	Perito del Tribunal, Ramboll
Sr. Jose Sananes	Ramboll
Secretariado del CIADI	
Sr. Marco Tulio Montañés-Rumayor	Secretario del Tribunal
En representación de la Demandante:	
Abogados	
Sr. Mark W. Friedman	Debevoise & Plimpton LLP
Sra. Ina C. Popova	Debevoise & Plimpton LLP
Sra. Laura Sinisterra	Debevoise & Plimpton LLP
Sra. Sarah Lee	Debevoise & Plimpton LLP
Sra. Mary Grace McEvoy	Debevoise & Plimpton LLP
Sra. Anisha Sud	King & Spalding LLP
Partes	
Sr. Jonathan Parr	Perenco
Sra. Josselyn Briceno	Perenco
Sra. Samita Mehta	ConocoPhillips
Peritos	
Sr. John Connor	GSI
Sr. Gino Bianchi	GSI
En representación de la Demandada	
Abogados	
Prof. Eduardo Silva Romero	Dechert (París) LLP
Sr. José Manuel García Represa	Dechert (París) LLP
Sr. Philip Dunham	Dechert (París) LLP
Sra. Maria Claudia Procopiak	Dechert (Londres) LLP
Sra. Gabriela González Giráldez	Dechert (París) LLP
Personal de apoyo	
Sr. Ricardo Montalvo Lara	Dechert (París) LLP
Sra. Anne Driscoll	Dechert (Paris) LLP
Partes	
Dr. Iñigo Salvador Crespo	Procurador General de la República del Ecuador
Dra. Claudia Salgado Levy	Directora Nacional de Asuntos Internacionales y Arbitraje en la Procuraduría General del Estado
Peritos	
Sr. José Francisco Alfaro Rodriguez	IEMS
Sr. Scott Crouch	DiSorbo (anteriormente, de RPS)
Sra. Martha Pertusa	TRC Environmental (anteriormente, de RPS)

41. Las Partes efectuaron sus presentaciones sobre costos el 19 de abril de 2019.

42. Las Partes presentaron sus escritos de réplica sobre costos el 10 de mayo de 2019.

43. El Tribunal deliberó de manera presencial en varias reuniones (celebradas en las siguientes fechas: 24-26 de abril de 2016, 26-27 de noviembre de 2016, 10-11 de junio de 2017, 25-26 de noviembre de 2017, 27-28 de enero de 2018, 13-15 de marzo de 2019 y 3 de junio de 2019), así como también por otros medios.

44. El 30 de agosto de 2019, el Tribunal declaró el cierre del procedimiento de conformidad con la Regla 38(1) de las Reglas de Arbitraje.

C. Comentarios Generales

45. El Tribunal reconoce desde el comienzo que el presente arbitraje ha llevado mucho tiempo. Sin embargo, hay muchas razones para ello que el Tribunal considera vale la pena destacar al inicio.

46. Surgieron dos razones fundamentales de las estimaciones de daños tanto en la demanda principal como en las reconvenciones ambiental y de infraestructura. Con respecto a la primera, el Tribunal concluyó luego de la Audiencia sobre *Quantum* que la consideración de la indemnización de daños reclamada por Perenco requería más trabajo en profundidad y el ajuste de los modelos financieros que habían utilizado los peritos de las Partes durante la etapa de *quantum*.

47. En el procedimiento de reconvención que continuó en forma separada, se requirió a las Partes que intentaran negociar un arreglo sobre la base de las determinaciones de hecho y de derecho contenidas en la Decisión Provisional sobre la Reconvención, en ausencia del cual el Tribunal nombraría a un perito independiente para que asista en el examen de los Bloques 7 y 21 (los "**Bloques**"). y haga una estimación de los posibles daños ambientales de conformidad con la Decisión Provisional sobre la Reconvención. Un arreglo negociado no fue posible. A las Partes les llevó tiempo elegir de manera conjunta un perito independiente adecuado que pudiera ser nombrado por el Tribunal, tal como se contempla en la Decisión Provisional sobre la Reconvención.

48. Este Perito Independiente debía evaluar el trabajo realizado por los peritos de las Partes y efectuar un muestreo adicional en Ecuador de conformidad con las conclusiones del Tribunal plasmadas en la Decisión Provisional sobre la Reconvención. Este trabajo se realizó desde agosto a mediados de diciembre de 2017 y el Informe del Perito Independiente no se recibió sino hasta el 19 de diciembre de 2018. Posteriormente, el Tribunal otorgó a las Partes la oportunidad de presentar sus comentarios sobre el Informe del Perito Independiente, además de comentarios generales sobre su trabajo, y celebró una audiencia de dos días en La Haya, en la que el Perito Independiente efectuó una presentación de 90 minutos sobre sus conclusiones y respondió a los comentarios presentados por escrito de las Partes, tras lo cual las Partes tuvieron la oportunidad de formular preguntas al Perito Independiente. Tras ello, el Tribunal deliberó con respecto a las reconvenciones, consideró las presentaciones sobre costos de las Partes y finalizó el presente Laudo.

49. A la luz de lo que antecede, según el Tribunal, tenía sentido abordar todas las cuestiones pendientes en materia de daños en un único Laudo.

50. El Tribunal reconoce que este ha sido un proceso muy lento para, al menos, una de las Partes, pero que, cuando se han reclamado montos importantes (aproximadamente USD 1.500 millones en la demanda principal y USD 2.500 millones en la reconvención), se requiere cuidadosa consideración y debida deliberación.

51. En este sentido, el Tribunal considera que corresponde relatar los pasos principales que se dieron en este extenso arbitraje:

(a) La solicitud de arbitraje fue presentada el 30 de abril de 2008.

(b) Esta se registró el 4 de junio de 2008.

(c) Una solicitud de arbitraje modificada fue presentada el 28 de julio de 2008.

(d) El Tribunal quedó constituido el 21 de noviembre de 2008.

(e) La primera reunión se celebró el 7 de febrero de 2009.

(f) La solicitud de medidas provisionales fue presentada el 19 de febrero de 2009.

(g) Una audiencia sobre medidas provisionales se celebró en París, el 19 de marzo de 2009, y tuvo como resultado una decisión del Tribunal de 41 páginas, emitida el 8 de mayo de 2009 ("**Decisión sobre Medidas Provisionales**").

(h) Un árbitro renunció el 16 de diciembre de 2009 y se suspendió el procedimiento El árbitro fue reemplazado por el Sr. Neil Kaplan CBE QC SBS el 13 de enero de 2010.

(i) El fallecido Lord Bingham, quien presidiera la primera etapa del arbitraje, renunció por enfermedad el 17 de febrero de 2010. El Juez Peter Tomka fue nombrado por el Presidente del Consejo Administrativo el 6 de mayo de 2010.

(j) Se celebró una audiencia sobre jurisdicción en La Haya el 2-3 de noviembre 2010. El Tribunal emitió su primera decisión sobre jurisdicción, de alrededor de 59 páginas, el 30 de junio de 2011.

(k) Mientras la demanda principal estaba en curso, el 5 de diciembre de 2011 Ecuador interpuso reconvenciones por supuestos daños ambientales y de infraestructura. Las Partes presentaron escritos al respecto, y se celebró una audiencia en La Haya del 9 al 17 de septiembre de 2013.

(l) Después de la presentación de escritos adicionales de las Partes, la audiencia sobre el fondo de la demanda principal junto con las cuestiones jurisdiccionales pendientes que se habían trasladado a la etapa de fondo se celebró en La Haya del 8 al 16 de noviembre de 2012. La Decisión sobre la Responsabilidad, que tenía una extensión de 251 páginas, fue transmitida a las Partes el 12 de septiembre de 2014. La traducción del original en inglés al español ocasionó cierta demora en la emisión de esta decisión.

(m) El 19 de diciembre de 2014, Ecuador solicitó una Reconsideración de la Decisión del Tribunal sobre la Responsabilidad. Luego de recibir presentaciones de las Partes, la solicitud fue considerada y posteriormente desestimada en una decisión de 24 páginas el 10 de abril de 2016.

(n) El 11 de agosto de 2015, se transmitió a las Partes una Decisión Provisional sobre la Reconvención que tenía una extensión de 187 páginas y cuya traducción necesaria al español tenía una extensión de 211 páginas.

(o) Tal como se resaltara *supra*, el Tribunal les indicó a las Partes que consideraran las conclusiones de derecho y de hecho incluidas en la Decisión Provisional sobre la Reconvención con miras a alentarlas a negociar un arreglo a la luz de las conclusiones del Tribunal. Las Partes accedieron a hacerlo, pero no lograron llegar a un arreglo. En consecuencia, el Tribunal procedió a actuar conforme al proceso alternativo previsto en la Decisión Provisional sobre la Reconvención, a saber, que nombraría a su propio perito a fin de evaluar la condición ambiental de los dos Bloques.

(p) La audiencia sobre daños del presente arbitraje se llevó a cabo durante una semana en París a partir del 9 de noviembre de 2015.

(q) Las presentaciones orales de cierre sobre daños se realizaron en La Haya el 21 de abril de 2016.

(r) Inmediatamente después de las presentaciones de cierre sobre daños, el Tribunal llevó a cabo su primer serie de deliberaciones en persona sobre *quantum*. En el curso de ellas, concluyó que, en vista del trabajo realizado por los peritos de las

Partes en materia de *quantum* hasta las presentaciones de cierre, correspondía desarrollar más ese trabajo y se procedió a un intercambio de correspondencia respecto de esta cuestión con las Partes.

(s) Poco después de la Audiencia sobre *Quantum* correspondiente a la demanda principal, luego de consultas respecto de la cuestión, el 25 de abril de 2016, las Partes le propusieron conjuntamente al Tribunal que nombrara al Sr. Scott MacDonald de Ramboll en calidad de perito del Tribunal para realizar el muestreo contemplado por el Tribunal en el supuesto de que las Partes no pudieran llegar a un arreglo respecto de la Reconvención Ambiental. El Tribunal consultó con el Sr. MacDonald para ver cómo se abordaría dicho ejercicio a la luz de las instrucciones del Tribunal plasmadas en la Decisión Provisional sobre la Reconvención.

(t) El 6 de julio de 2016, el Sr. MacDonald fue nombrado Perito Independiente del Tribunal mediante la Resolución Procesal No. 16.

(u) Del 1 de noviembre de 2016 al 5 de noviembre de 2016, el Sr. MacDonald visitó Ecuador para inspeccionar los dos Bloques a efectos de determinar su plan de trabajo posterior.

(v) El Tribunal continuó con sus deliberaciones sobre *quantum* en una reunión celebrada en Hong Kong el 25 y 26 de noviembre de 2016, a la que le siguió un trabajo analítico adicional.

(w) El 7 de febrero de 2017, el tribunal del caso *Burlington* emitió su Decisión sobre Reconsideración y Laudo.[1] Después de reflexionar al respecto, el Tribunal decidió solicitar las opiniones de las Partes en cuanto a qué parte de ese Laudo, en su caso, era relevante para la consideración por parte del Tribunal de las cuestiones planteadas ante él, dado que Burlington y Perenco eran los miembros del Consorcio que operaba los Bloques 7 y 21, y muchos de los hechos son comunes a ambas diferencias. Se recibieron presentaciones de las Partes sobre este punto el 18 de abril de 2017.

(x) También el 18 de abril de 2017, Perenco presentó su Primera Solicitud de Desestimación. Con respecto a las reconvenciones ambiental y de infraestructura, Perenco alegó que el laudo del caso *Burlington* era *res judicata* para las Partes en el procedimiento que nos ocupa, y, por ende, la Decisión Provisional sobre la Reconvención del Tribunal había sido superada por las determinaciones del tribunal del caso *Burlington* sobre la responsabilidad del Consorcio (tal como se estableciera en un reclamo iniciado por Ecuador en contra de la también miembro del Consorcio y supuesto colaborador de Perenco, Burlington). Aseveró que, por lo tanto, el trabajo del perito ambiental debía darse por terminado.

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[1] *Burlington Resources Inc. c. República de Ecuador*, Caso CIADI No. ARB/08/5, Decisión sobre Reconsideración y Laudo, 7 de febrero 2017 ("laudo *Burlington*") CA-CC-60. El tribunal de Burlington también emitió en la misma fecha una Decisión sobre Reconvenciones, CA-CC-59 ("Decisión sobre Reconvenciones de *Burlington*") que se hizo parte integral del laudo de Burlington.

(y) El Tribunal fijó un calendario de presentaciones adicionales en la materia, que se transmitió a las Partes el 3 de mayo de 2017, luego de que las Partes no llegaran a un acuerdo respecto de un calendario.

(z) El 23 de mayo de 2017, Ecuador presentó su contestación a la Primera Solicitud de Desestimación de Perenco.

(aa) El 10 y 11 de junio de 2017, el Tribunal deliberó de manera presencial sobre la cuestión de *quantum* en La Haya.

(bb) El 13 de junio de 2017, Perenco presentó su réplica a la contestación de Ecuador sobre la Primera Solicitud de Desestimación de Perenco.

(cc) El 4 de julio de 2017, Ecuador presentó su dúplica.

(dd) El 18 de agosto de 2017, el Tribunal desestimó la Primera Solicitud de Desestimación de Perenco.

(ee) Mientras tanto, a partir de agosto de 2017, el Sr. MacDonald y su equipo empezaron a realizar trabajo de campo en sitios identificados para propósitos de preparar sus actividades de muestreo.

(ff) El 30 de enero de 2018, Perenco presentó su Segunda Solicitud de Desestimación. Esto fue sobre la base de que el arreglo de Burlington con Ecuador, así como el pago total de la deuda conjunta de Burlington y Perenco respecto de las reconvenciones, extinguieron cualquier responsabilidad conjunta que tanto Perenco como Burlington tuvieran frente a Ecuador y dejaron sin sentido la prosecución adicional de las reconvenciones por parte de Ecuador.

(gg) El 5 de febrero de 2018, en respuesta a la invitación del Tribunal, Ecuador presentó sus comentarios acerca de la Segunda Solicitud de Desestimacióny propuso un calendario alternativo de presentación de escritos luego de que las Partes no llegaran a un acuerdo respecto de un calendario de presentación de escritos.

(hh) El 8 de febrero de 2018 y el 12 de febrero de 2018, las Partes presentaron comentarios adicionales acerca de los pasos a seguir con la Segunda Solicitud de Desestimación.

(ii) El 15 de febrero de 2018, el Tribunal fijó el calendario de presentación de escritos tras considerar los comentarios de las Partes y decidió que el trabajo del Sr. MacDonald debía continuar. No habría ni divulgación ni audiencia en relación con la solicitud.

(jj) De conformidad con esto, el 15 de marzo de 2018, Ecuador presentó su contestación a la Segunda Solicitud de Desestimación de Perenco (“Contestación”).

(kk) El 5 de abril de 2018, Perenco presentó su Réplica.

(ll) El 26 de abril de 2018, Ecuador presentó su Dúplica.

(mm) El 30 de julio de 2018, el Tribunal emitió su Decisión sobre la Segunda Solicitud de Desestimación de Perenco, en la que, por mayoría, rechazó dicha solicitud.

(nn) El 19 de diciembre de 2018, tras recibir el Informe del Perito Independiente, el Tribunal lo transmitió a las Partes a fin de solicitar comentarios al respecto. Después

de recibir los comentarios de las Partes al respecto, los días 11-12 de marzo de 2019 el Tribunal condujo una audiencia sobre el Informe del Perito Independiente. El Tribunal también se reunió durante los días 13-15 de marzo de 2019 y 3 de junio de 2019 para las reuniones finales en persona.

(oo) El 19 de abril y el 10 de mayo de 2019, el Tribunal recibió las presentaciones sobre costos y la réplica de estas últimas de las Partes en el formato que había solicitado.

52. Los siguientes comentarios son pertinentes:

(a) Ha habido 7 audiencias en el presente caso

(b) Los escritos en el marco del presente caso han sido voluminosos y han tenido una extensión de no menos de 3,816 páginas;

(c) Ha habido no menos de 55 declaraciones testimoniales con una extensión de no menos de 1028 páginas sin incluir los anexos;

(d) Los informes periciales en este caso ascienden a un total de 53. En total, tienen una extensión de no menos de 2,539 páginas sin incluir los anexos;

(e) El expediente probatorio del presente arbitraje, sin incluir los puntos enumerados *supra*, supera las 125,302 páginas; y

(f) Ha habido diversos roces interlocutorios entre las Partes, causados desafortunadamente por la falta de acuerdo entre ellas respecto de una serie de cuestiones procesales, que han ocupado el tiempo del Tribunal.

53. Tal como se dejara constancia *supra*, desde la culminación de las presentaciones escritas y orales, el Tribunal ha deliberado tanto en persona como por medios electrónicos. Este ha sido un caso complejo y reñido. El Tribunal ha considerado todos los puntos que plantearon las Partes si bien se ha remitido exclusivamente a las presentaciones y los puntos más importantes a efectos de su decisión.

54. La **Parte II** de este Laudo contiene la evaluación por parte del Tribunal de la indemnización de daños adeudada a Perenco por los incumplimientos del Tratado y del contrato. La **Parte III** contiene la evaluación por parte del Tribunal de la indemnización de daños ambientales que Perenco debe pagarle a Ecuador por por las operaciones del Consorcio. La **Parte IV** contiene la consideración por parte del Tribunal de la reconvención de infraestructura interpuesta por Ecuador. La **Parte V** contiene la decisión del Tribunal respecto de los respectivos reclamos y presentaciones sobre costos de las Partes. Este Laudo le sigue a la Decisión sobre Jurisdicción de 30 de junio de 2011, a la Decisión sobre la Responsabilidad de 12 de septiembre de 2014, a la Decisión sobre Reconsideración de 10 de abril de 2015,

a la Decisión Provisional sobre la Reconvención de 11 de agosto de 2015, y a las decisiones sobre las dos solicitudes de Perenco de desestimación de las reconvenciones de la Demandada de 18 de agosto de 2017 y 30 de julio de 2018, y todas ellas deben interpretarse y considerarse como parte integrante de este Laudo.

II. DAÑOS RECLAMADOS EN RELACIÓN CON EL INCUMPLIMIENTO DEL TRATADO Y DE LOS CONTRATOS DE PARTICIPACIÓN

A. Las Posiciones de las Partes en la Etapa de *Quantum*

55. La etapa de daños surge de la Decisión del Tribunal sobre la Responsabilidad cuya parte dispositiva establecía que tuvieron lugar los siguientes incumplimientos: (i) incumplimiento de los Contratos de Participación de los Bloques[2] 7 y 21 respecto de la Ley 42 al 99%; (ii) incumplimiento del Contrato de Participación del Bloque 21 como resultado de la declaración de caducidad; (iii) incumplimiento del Artículo 4 del Tratado[3] respecto de la Ley 42 al 99%; e (iv) incumplimiento del Artículo 6 del Tratado como resultado de la declaración de caducidad[4].

1. La Posición de la Demandante

56. Con la responsabilidad de Ecuador comprometida, Perenco solicitó inicialmente una indemnización de USD 1.572 millones en concepto de daños[5].

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2 Véase Contrato de Modificación del Contrato de Prestación de Servicios a una Participación para la Exploración y Explotación de Hidrocarburos del Bloque 7 de la Región Amazónica, que incluye el Contrato para el Campo Unificado Coca-Payamino (“**Contrato de Participación del Bloque 7**”) y el Contrato de Participación para la Exploración y Explotación de hidrocarburos en el Bloque 21 de la Región Amazónica (“**Contrato de Participación del Bloque 21**”). De manera conjunta se referirán como “**Contratos de Participación**” o “**CPs**”.

3 Acuerdo entre el Gobierno de la República del Ecuador y el Gobierno de la República Francesa para la Promoción y Protección de Inversiones (“**Tratado**”).

4 Decisión sobre la Responsabilidad, párrs. 606 y 713, en particular, párrs. 713(4), (6), (8), (12) y (14). El Tribunal también concluyó que determinados actos ejecutados por Ecuador entre la aplicación del Decreto 662 y la caducidad también violaron el estándar de trato justo y equitativo.

5 Cl. Rep. Q., párr. 278(b): fecha sustituta actualizada del 1 de julio de 2015 (y otros ajustes).

57. En función del testimonio del Sr. John Crick (asesor del Gerente General de Perenco[6]), de los informes periciales del Dr. Richard Strickland y de los informes periciales económicos y financieros del Profesor Joseph Kalt de Compass Lexecon, Perenco afirmó que tiene derecho al monto de USD 1.572 millones, calculado sobre una base *ex post*, a fin de compensarla por las pérdidas resultantes de los incumplimientos por parte de Ecuador de sus obligaciones contractuales y en virtud del derecho internacional.

58. Perenco había pretendido en su Solicitud de Arbitraje que se emitan declaraciones de que las obligaciones en virtud del Tratado y de los Contratos de Participación se habían incumplido, además de una resolución que ordenara que Ecuador declare nulas las medidas pertinentes y el restablecimiento de los derechos de Perenco en virtud de los Contratos de Participación, una resolución que ordenara que Ecuador se ajuste a los términos de los Contratos de Participación y los cumpla, así como una indemnización en concepto de daños[7]. Perenco también había solicitado Medidas Provisionales en contra de Ecuador, mediante las cuales pretendía restringir cualquier acción de cobro de valores en virtud de la Ley 42 al igual que cualquier acción de modificación, resolución, rescisión o repudio de los Contratos de Participación[8].

59. A causa de distintos sucesos, la naturaleza del resarcimiento solicitado cambió con el tiempo. En definitiva, cuando se llegó a la etapa de *quantum*, Perenco ya no solicitaba el restablecimiento de sus derechos en virtud de los Contratos de Participación, que se habían rescindido en julio de 2010, sino que, en su lugar, pretendía una indemnización en concepto de daños "por un monto que eliminara todas las consecuencias de los actos ilegales de la Demandada y restableciera la situación que habría existido si dichos actos no se hubieran

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6 Crick WS II, párr. 1. El Sr. Crick se incorporó a Perenco en el año 1986 y fue responsable de todos los aspectos geocientíficos del crecimiento de la compañía hasta el año 1995. De 1995 a 2003, fue el gerente técnico responsable de los aspectos geocientíficos de la actividad de desarrollo de la compañía. En el año 2003, creó y lideró un grupo de planificación a largo plazo. Ocupa su posición actual desde 2008. (*Véase también* Crick WS II, párr. 4).

7 Solicitud de Arbitraje de fecha 30 de abril de 2008, párr. 42; Solicitud de Arbitraje Modificada de fecha 28 de julio de 2008, párr. 42.

8 Solicitud de Arbitraje, párr. 43; Solicitud de Arbitraje Modificada, párr. 43. Solicitud de Medidas Provisionales de la Demandante de fecha 19 de febrero de 2009.

cometido, valorado a la fecha del laudo, por el monto de USD 1.698,4 millones, sujeto a actualización más cerca de la fecha del laudo"[9]. Este monto posteriormente se ajustó a USD 1.572 millones[10].

60. Esta cifra de USD 1.572 millones se ajustó nuevamente a la baja a USD 1.423 millones al 18 de abril de 2016. Durante los alegatos de clausura sobre el *quantum*, los abogados de la Demandante declararon que:

> "… [e]n los precios actuales del petróleo, en un escenario de prórroga contractual, Perenco no hubiese seguido adelante con las reinyecciones de agua en Coca y Payamino. … [e]ntonces en el mundo actual con precios del petróleo bastante bajos, esos pozos serían antieconómicos. Perenco entonces debe mantenerse veraz a los principios que ha planteado como principio básicamente de establecimiento"11.

61. Perenco también solicita que los intereses posteriores al laudo se calculen a tasas comerciales capitalizadas en forma anual, que Ecuador pague todos los costos legales y demás costos relacionados, como así también que todos los montos pagados por Ecuador de conformidad con el Laudo sean netos de impuestos u otras obligaciones fiscales ecuatorianos. Por último, Perenco también solicita la desestimación de las reconvenciones de Ecuador.

62. A medida que avanzaba la etapa de daños, el Profesor Kalt expuso amablemente su opinión acerca de los puntos principales que dividían a las Partes. Tal como se muestra en el fragmento de la tabla extraído de su 4.° informe pericial[12]:

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9 Cl. Mem. Q., párr. 182(b). [Traducción del Tribunal]

10 Cl. Rep. Q., párr. 278 (b).

11 Tr. Q. (6) 28:8-11, 28:19-29:1 (Alegato de clausura de la Demandante).

12 Kalt ER IV, Anexo JK-64. [Traducción del Tribunal]

Daños Revisados de Kalt	**USD 1.572,4**
Supuestos Principales de Brattle	***Efecto Independiente en los Daños (Millones de USD)***
Valuación *Ex Ante*	-USD 874,9
Niveles de Producción RPS	-USD 910,0
Sin Estabilización de la Ley 42 al 50%	-USD 724,4
Sin Prórroga del Bloque 7	-USD 626,0
Efecto Residual de Otros Supuestos	-USD 44,5[13]

2. La Posición de la Demandada

63. La Demandada ha solicitado las siguientes formas diferentes de resarcimiento, según las conclusiones del Tribunal acerca de las cuestiones principales. En síntesis y principalmente, solicita que no le otorgue compensación alguna a Perenco en aras de dar cuenta de los montos impagos respecto de los valores en virtud de la Ley 42 que Perenco le adeuda a Ecuador[14]. Sin embargo, si el Tribunal estuviera dispuesto a otorgar alguna compensación, dicha compensación debería calcularse con arreglo a las alegaciones de Ecuador[15].

64. En respuesta al Profesor Kalt, el Profesor James Dow y el Sr. Richard Caldwell de The Brattle Group ("**Brattle**"), peritos de la Demandada, presentaron un "gráfico de cascada" (el "**Gráfico de Cascada**") que representaba los efectos en el *quantum* de ciertas decisiones

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[13] Otros elementos del análisis FCD respecto de los cuales Brattle y el Profesor Kalt disintieron incluyen el trato de los precios futuros del petróleo, los costos operativos, los costos de capital, el trato fiscal de las tarifas en el oleoducto OCP y los intereses anteriores al laudo. *Véanse* párrs. 101 *y ss.* de Kalt ER IV.

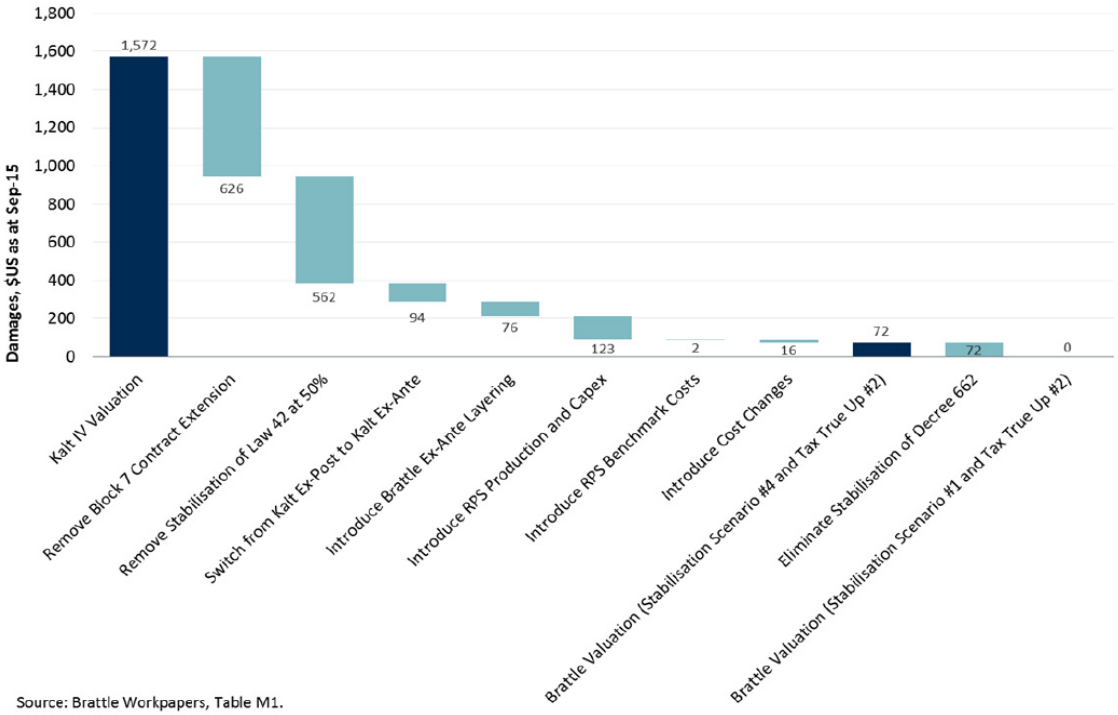
[14] Resp. PHB Q., párr. 183. Ecuador había solicitado anteriormente, durante la Etapa de Responsabilidad, declaraciones de que tanto la promulgación de la Ley 42 y los decretos de aplicación como la iniciación de procedimientos de coactivas no redundaron en el incumplimiento de los Contratos de Participación ni del Tratado.

[15] Resp. PHB Q., párr. 184. Ecuador asevera que la Audiencia sobre *Quantum* demostró que el verdadero reclamo de Perenco ascendía a un máximo de USD 343 millones (Resp. PHB Q, párr. 1).

que, según Ecuador, el Tribunal debería adoptar en relación con diversos aspectos del reclamo planteado por Perenco. La versión inicial de la Demandada del "Gráfico de Cascada" (de fecha 15 de septiembre de 2015) fue actualizada posteriormente para reflejar la situación al 18 de abril de 2016[16].

65. Si el Tribunal aceptara cada una de las críticas de Ecuador respecto de la posición de Perenco en materia de daños, el monto estimado por el Profesor Kalt se reduciría considerablemente:

Figure 16: Damages Waterfall



Source: Brattle Workpapers, Table M1.

B. Las Cuestiones Principales que Separan a las Partes

66. Durante la Audiencia sobre el *Quantum* y en el Cierre sobre *Quantum*, quedó claro que las cuestiones principales que separaban a las Partes con respecto a la estimación de los daños son relativamente pocas.

16 Alegato de clausura de la Demandada Q, diapositiva 101.

67. El gráfico de cascada de la Demandada (*supra*) identificó cinco cuestiones principales que dividían a las Partes:

1. El enfoque general hacia la valuación de los daños: es decir, si los daños deben calcularse *ex ante* o *ex post*, y sobre una base de '*estratificación*' o no;
2. Si en el escenario 'contrafáctico', habría habido una prórroga del Contrato del Bloque 7 (que debía vencer en agosto de 2010) y, en ese caso, la naturaleza de dicha prórroga y sus términos;
3. Si, al momento de estimar los daños por expropiación, el Tribunal debería aceptar el programa de perforación 'contrafáctico' del Sr. Crick correspondiente tanto al Bloque 7 como al Bloque 21 o el programa de perforación más modesto de RPS;
4. Si todos los efectos de la Ley 42 al 99%, o solo una parte de ellos, deberían ignorarse en el análisis 'contrafáctico'; y
5. Si debería aplicarse un ajuste de la estimación ('*true-up)*' en favor de Ecuador, cuyo efecto consistiría en ajustar la indemnización de daños adeudada a Perenco.

68. Al momento de las presentaciones del día de cierre, los abogados de Perenco habían reducido la lista a cuatro cuestiones: (i) *restitución*, "según la cual los daños y perjuicios de Perenco deben ser calculados a la fecha del Laudo en vez de la fecha del incumplimiento"; (ii) *producción*, "en donde la cantidad de pozos que hubiese perforado Perenco y los volúmenes de petróleo que hubiese producido, deben basarse en las proyecciones del señor Creek y no en las de RPS"; (iii) *absorción*, "según la cual el derecho contractual de absorción de los pagos de la Ley 42 deben ser valorados en vez de ignorados"; y (iv) *prórroga*, "según la cual Perenco debe tener el valor de la prórroga del contrato del Bloque 7 a la que tenía derecho y que quería Perenco y Ecuador si no hubiesen existido los incumplimientos de Ecuador"[17].

C. El Punto de Partida del Tribunal

69. El Tribunal empieza recordando que se comprende perfectamente en la jurisprudencia en materia de daños en general que la valuación de los daños, sean contractuales,

[17] Tr. Q. (6) 10:2-18.

extracontractuales o en virtud de un tratado, "no [es] una ciencia exacta"[18]. Tampoco es un ejercicio de teoría económica al que las Partes sometieran al Tribunal en el presente caso. La amplia referencia a la teoría económica desarrollada principalmente en el análisis de decisiones judiciales estadounidenses no le resultó útil al Tribunal al momento de estimar una cifra razonable para compensar a Perenco por el daño que ha sufrido como resultado de los incumplimientos de Ecuador. El Tribunal concluyó que el debate acerca del incumplimiento "oportunista" y "eficaz" [Traducción del Tribunal], si bien era interesante para economistas, doctrinarios jurídicos y jueces en los Estados Unidos, carecía de valor real para el Tribunal y era irrelevante para su tarea de determinar el *quantum* de la indemnización de daños a la que Perenco tenía derecho[19]. Dicho esto, el Tribunal ha aprovechado el trabajo altamente profesional de los peritos acerca de las cuestiones principales que el Tribunal ha tenido que decidir finalmente al momento de emitir este Laudo.

70. El Tribunal comenzará por exponer en términos generales cómo pretende tratar las cuestiones principales que identificaron las Partes. En vista de las diversas decisiones adoptadas en este Laudo y los ajustes que tuvieron que realizarse en los modelos financieros que emplearon los peritos a fin de incorporar dichos cambios, el Tribunal considera que no es necesario enumerar todos los argumentos planteados por las Partes.

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[18] EL-281, *Joseph C. Lemire c. Ucrania*, Caso CIADI No. ARB/06/18, Laudo, 28 de marzo de 2011, párr. 248: "Si bien la existencia de daño es segura, el cálculo del monto preciso de la compensación se encuentra plagado de mucha más dificultad, inherente a la propia naturaleza de la hipótesis 'contrafáctica'. La valuación no es una ciencia exacta. El Tribunal no tiene la bola de cristal y no puede afirmar saber lo que habría ocurrido en una hipótesis de no incumplimiento; lo mejor que puede hacer un tribunal es realizar una evaluación fundada y consciente, teniendo en cuenta todas las circunstancias pertinentes del caso, similar a la que realiza cualquiera que calcula el valor de un negocio sobre la base de sus ganancias futuras probables". [Traducción del Tribunal]

[19] Aunque la Demandante ha alegado que los Contratos de Participación se rigen por el derecho ecuatoriano, también ha afirmado que el derecho ecuatoriano en materia de daños articula esencialmente el mismo estándar de reparación que el estándar de derecho internacional expresado en el marco del caso *Chorzów Factory* y el mismo enfoque hacia ella (Cl. Mem. Q., párr. 17; Cl. PHB Q., párr. 2). Por el contrario, la Demandada ha procedido sobre la base del derecho internacional, si bien no concuerda con la creencia de que el derecho ecuatoriano articula el mismo estándar de reparación íntegra que el derecho internacional (Resp. C-Mem. Q., párrs. 17, 28 y 29). Dado que las Partes se concentraron en las cuestiones de derecho internacional que surgieron en la etapa de *quantum*, el Tribunal también se ha concentrado en dichas cuestiones.

71. Determinadas cuestiones se abordan al inicio. Estas se relacionan con lo siguiente: (i) la(s) fecha(s) de valuación de los daños; (ii) la decisión del Tribunal de emplear dos fechas de valuación; y (iii) el uso de prueba contemporánea. Luego de abordar estas cuestiones, el Tribunal procederá a resumir su enfoque general hacia el equilibrio de las cuestiones vinculadas a la cuantificación de los daños.

1. La Fecha de Valuación

72. La cuestión quizá más significativa que dividía a las Partes se relacionaba con la(s) fecha(s) de valuación. Perenco y su perito (siguiendo instrucciones) eligieron una fecha única, a saber, la fecha de la expropiación el 10 de julio de 2010. Alegando que la expropiación era ilícita y teniendo en cuenta el resarcimiento restitutivo que había solicitado inicialmente, Perenco argumentó que debía tener derecho al más elevado de los valores de los derechos de Perenco respecto de los dos Bloques: a la fecha de la declaración de caducidad o a la fecha del Laudo[20]. En este aspecto, el Profesor Kalt, perito de Perenco, describió lo que veía como la naturaleza interrelacionada de los diversos incumplimientos que advirtiera el Tribunal; esto lo llevó a juntar los incumplimientos y a considerar que culminaban en la confiscación formal de los derechos de Perenco respecto de los Contratos de Participación que se hizo efectiva mediante la declaración de caducidad.

73. La cuestión valuatoria se encontraba ligada al debate de las Partes acerca de la denominada ‘estratificación’. Mientras que Perenco se pronunciaba a favor de una fecha única (basada en la expropiación), Ecuador y sus peritos (siguiendo instrucciones), por su parte, afirmaban que Perenco y el Profesor Kalt habían agrupado de manera errónea diversos incumplimientos independientes que habían tenido lugar durante aproximadamente dos años y medio como si el Tribunal hubiera encontrado una expropiación gradual; esto a pesar de que el Tribunal hubiera rechazado expresamente el reclamo de Perenco sobre ese punto y resuelto que ni las medidas coactivas ni la confiscación por parte de Ecuador de

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[20] Cl. Mem. Q., párrs .11 y 22; Cl. Rep. Q., párrs. 34-35 y 46-47. Perenco invoca el enfoque adoptado por la Corte Permanente de Justicia Internacional en el contexto del caso *Factory at Chorzów* que contempló un cálculo de los daños causados por una expropiación ilícita diferente del que se realizaría en relación con una lícita. *Véase también* Tr. Q. (6) 9 *y ss.* (Alegato de clausura de la Demandante).

los derechos de operación respecto de los Bloques una vez que Perenco hubiera suspendido las operaciones podían tenerse en cuenta en aras de declarar la existencia de una expropiación indirecta o gradual[21]. Tal como los abogados de Ecuador explicaran en el alegato de clausura:

> "… [p]ara que quede claro, el 662 no fue promulgado, como sugiere Perenco implícitamente en sus argumentos, con intención de expropiar ulteriormente las inversiones de Perenco. Este no es un caso de expropiación gradual. Lo que hay que hacer es hacer un cálculo de octubre de 2007 en adelante y, para evitar la doble contabilidad, calcular desde el julio de 2010 en adelante sin calcular el impacto del Decreto 662"[22].

74. De conformidad con el Artículo 36(1) de los Artículos de la CDI sobre Responsabilidad del Estado por Hechos Internacionalmente Ilícitos (los "**Artículos de la CDI**"), el Tribunal considera que debería otorgar compensación en la medida en que dicho daño no sea reparado por la restitución y que dicha compensación debería cubrir "todo daño susceptible de evaluación financiera, incluido el lucro cesante en la medida en que éste sea comprobado". El Tribunal recuerda que se encuentra bien establecido que la carga de probar los daños recae en la parte reclamante[23]. En ausencia de una expropiación gradual o indirecta hecha efectiva por una serie de medidas separadas, el enfoque ortodoxo establece que le corresponde a la demandante identificar los daños causados por cada incumplimiento al momento de su acaecimiento[24]. Además, el foco de la investigación

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21 Resp. C-Mem. Q., párrs. 4, 34, 35 y 207; Resp. Rej. Q., párr. 132.

22 Tr. Q. (6) 218.

23 EL-265, *S.D. Myers, Inc. c Canadá*, CNUDMI, Segundo Laudo Parcial, 21 de octubre de 2003, párr. 173; CA-002-L, *Archer Daniels Midland Company y Tate & Lyle Ingredients Americas, Inc. c. Estados Unidos Mexicanos*, Caso CIADI No. ARB(AF)/04/5, Laudo, 21 de noviembre de 2007, párr. 285; CA-439-L, *Gemplus S.A., SLP S.A., y Gemplus Industrial, S.A. de C.V. c. Estados Unidos Mexicanos*, Caso CIADI No. ARB(AF)/04/3, Laudo, 10 de junio de 2010, párrs. 12-56 [en adelante *Gemplus c. México*].

24 CA-007-L, *CME Czech Republic B.V. c. República Checa*, CNUDMI, Laudo Parcial, 13 de setiembre de 2001, párrs. 583-585; EL-265, *S.D. Myers, Inc. c. Canadá*, CNUDMI, Segundo Laudo Parcial, 21 de octubre de 2003, párr. 140; CA-004-L, *BG Group Plc. c. República Argentina*, CNUDMI, Laudo Definitivo, 24 de diciembre de 2007, párr. 428; CA-003-L, *Azurix Corp c. República Argentina*, Caso CIADI No. ARB/01/12, Laudo, 14 de julio de 2006, párrs. 417, 418 y 424; CA-012A-L, *Enron Corp. y Ponderosa Assets, L.P. c. República Argentina*, Caso CIADI No. ARB/01/3, Laudo, 22 de mayo de 2007, párrs. 389, 405, 420-23 y 436.

debe encontrarse en los daños causados *inmediatamente* por los incumplimientos declarados por el Tribunal[25].

75. Por ende, el Tribunal considera que los esfuerzos de Brattle de valoración del impacto del Decreto 662, el primer hecho ilícito, en los derechos de Perenco respecto de los Bloques no son equivocados en principio. Todo lo contrario. El Tribunal coincide con Ecuador en cuanto a la conveniencia, en las circunstancias del presente caso, de valorar los incumplimientos en el momento en que tuvieron lugar, y no de concentrarse exclusivamente en el último incumplimiento terminado. El Tribunal considera que la caracterización de los hechos por parte de los abogados de Ecuador, citada en el párrafo 73 *supra*, es correcta. Incluso durante la etapa de Medidas Provisionales del procedimiento que nos ocupa, los abogados de Ecuador confirmaron que su cliente no tuvo intención alguna en ese momento de expropiar los derechos de Perenco respecto de los Bloques. El Tribunal hizo referencia a esta intención de no expropiar en la Decisión sobre Responsabilidad al momento de analizar si el Ministerio debería haberse abstenido de declarar la caducidad mientras el procedimiento de arbitraje que nos ocupa se encontrara en curso[26].

76. Tal como el Tribunal resolviera anteriormente, Perenco no planteó un reclamo de expropiación gradual, y su intento de emplear ahora en su lugar lo que denominaba un "curso de conductas interrelacionadas" es en vano[27]. Por supuesto, los incumplimientos se encuentran interrelacionados en el sentido de que cada uno forma parte de la diferencia conforme a su evolución, pero cada uno debe examinarse en su propio momento y en su

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25 CA-033-L, Proyecto de Artículos sobre Responsabilidad del Estado por Hechos Internacionalmente Ilícitos, con comentarios 2001, Anuario de la Comisión de Derecho Internacional, 2001, Tomo II, Segunda Parte, U.N. Doc. A/CN.4/SER.A/2001/Add.1 (Parte 2), pág. 92, Art. 31, comentario 10.

26 Decisión sobre Responsabilidad, párr. 709, que cita la carta de Ecuador al Tribunal: "Ecuador tiene la intención de hacer cumplir la Ley 42 de tal manera de evitar la interrupción de las actividades de Perenco. En particular, Ecuador no desea incautar los bienes del Consorcio más allá del equivalente en petróleo del valor de la deuda pendiente de pago. Tampoco desea Ecuador resolver los Contratos de Participación, o tomar acciones legales contra los representantes de Perenco". CE-212, Carta de las Demandadas sobre la Decisión sobre Medidas Provisionales del Tribunal y la Ley 42, 15 de mayo de 2009.

27 Tr. Q. (6) 97:417-18. *Véase* Decisión sobre Responsabilidad, párr. 710, que rechaza el argumento de expropiación gradual planteado por Perenco.

propio contexto. Esto sucede particularmente cuando se recuerda que el Tribunal no aceptó como tales determinados hechos que, según se alegaba, suponían un incumplimiento contractual o del Tratado. A modo de ejemplo, si bien el Tribunal aceptó que Perenco podía suspender de manera lícita las operaciones en virtud de la doctrina de *exceptio non adempleti contractus*, también aceptó que, en dichas circunstancias, el Estado podía intervenir de manera lícita en los Bloques de modo de salvaguardar su continuidad operativa y productividad una vez que el Consorcio suspendiera las operaciones[28]. En forma similar, el Tribunal resolvió que la diferencia relativa a las coactivas, que surgió cuando la decisión de Perenco de no pagar los valores en virtud de la Ley 42 llevó a Ecuador a intentar liquidar la deuda fiscal reclamada de 2008, derivaba de los hechos de ambas Partes. El Tribunal resolvió que ninguno de estos dos hechos podía tenerse en cuenta en sustento de la teoría de Perenco de la existencia de una expropiación gradual[29].

77. El Tribunal también recuerda que, al momento de analizar si Perenco había planteado su reclamo de incumplimiento del Tratado en relación con la Ley 42 al 50%, el Tribunal aludió a la combinación de distintos sucesos que tuvieron lugar en distintos momentos[30]. El Tribunal ha tenido el mismo sentido en la etapa de *quantum* del procedimiento. Considera que el Decreto 662 y la caducidad, separados como estaban por un período de más de dos años, no pueden combinarse de modo de aterrizar en una fecha única que luego se utilice para valorar el impacto colectivo de los incumplimientos.

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28 Decisión sobre Responsabilidad, párrs. 705 y 710.

29 *Ibid.*, párr. 703.

30 *Ibid.*, párr. 580: "Al presentar su alegación de incumplimiento, la Demandante tiende a confundir una serie de medidas que fueron tomadas en diferentes momentos a lo largo de un período de unos cuatro años. En sus escritos, la Demandante tendía a combinar: (i) La Ley 42 al 50%; (ii) la promulgación y aplicación del Decreto 662; (iii) las exigencias de la administración de Correa para la migración de contratos de participación a un modelo de contratos de prestación de servicios; (iv) la posterior exigencia de una migración más rápida a los contratos de prestación de servicios que la que se buscaba inicialmente; (v) las exigencias de pagos de gravámenes que se reclamaba que se adeudaban en cumplimiento con la Ley 42; (vi) el lanzamiento de las coactivas; (vii) la decisión de aplicar las coactivas a pesar de la recomendación del Tribunal de no hacerlo mientras el laudo del arbitraje estuviera pendiente; y (viii) la ruptura en las negociaciones que generó la decisión del Consorcio de suspender las operaciones, que a la vez llevó a la iniciación del proceso que resultó en la declaración de *caducidad*".

78. El Tribunal no solo estableció una diferencia en su Decisión sobre Responsabilidad entre el Decreto 662, el primer incumplimiento completo, y la caducidad, el último incumplimiento completo, sino que también distinguió entre el Decreto 662 y las otras violaciones del trato justo y equitativo que siguieron antes de que Perenco suspendiera las operaciones. El Ministerio declaró la caducidad un año después de solicitarle a Perenco que regresara a los Bloques en cuatro ocasiones separadas, solicitudes que Perenco se negó a consentir a menos que Ecuador cumpliera con la Decisión sobre Medidas Provisionales del Tribunal. Solamente después de que el Ministerio diera estas advertencias y de que Perenco se negara a retomar las operaciones, el Ministerio emitió una declaración de caducidad[31]. Indicar esto no supone excusar al Ministerio – el Tribunal ha estado de acuerdo con Perenco que la caducidad equivalía a una expropiación en virtud del Artículo 6 del Tratado – sino señalar que la decisión de Perenco de suspender las operaciones obligaba al gobierno a intervenir a fin de proteger los Bloques y su producción, y las advertencias de que Perenco debía retomar las operaciones o enfrentar una declaración de caducidad se basaban en una de las causales de caducidad enumeradas en el Artículo 74 de la Ley de Hidrocarburos[32].

79. De relevancia específica para la fecha única de valuación propuesta basada en el argumento del "curso de conductas interrelacionadas", el Tribunal destaca que las propias violaciones del trato justo y equitativo no fueron tratadas como un mismo paquete en la Decisión sobre Responsabilidad. Además de rechazar la alegación de expropiación gradual, el Tribunal estableció una diferencia entre las medidas ofensivas del siguiente modo:

> "606….el Decreto 662 marcó el comienzo de una serie de medidas que incumplían el Artículo 4 tomado en relación con los Contratos de Participación, es decir: (i) la exigencia de que los contratistas acordaran abandonar sus derechos que surgían de los contratos de participación y que migraran a lo que por un considerable período fue un modelo no específico, a punto tal que los contratistas no podían discernir precisamente qué se les pedía que adoptaran; (ii) escalar las exigencias de negociación, en especial en abril de 2008, cuando el Presidente inesperadamente suspendió las negociaciones y rechazó lo que recientemente había sido acordado en un Acuerdo Parcial respecto de uno de los bloques; (iii) hacer declaraciones amenazantes y coercitivas, incluidas amenazas de expulsión de Ecuador; y (iv) tomar pasos para

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31 *Ibid.*, párr. 707.

32 *Ibid.*, párr. 706.

> aplicar la Ley 42 contra Perenco (y Burlington) por falta de pago de valores que se reclamaba que se adeudaban, una porción de los cuales se ha sostenido que incumplía el Artículo 4, y cuando no se efectuó pago alguno, incautar y vender por la fuerza el petróleo producido en los Bloques 7 y 21 a fin de cobrar la deuda reclamada en virtud de la Ley 42. Esto estableció la etapa de suspensión de operaciones de parte del Consorcio y en última instancia la declaración de la caducidad que formalmente terminó los derechos del Consorcio a los dos bloques.
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> 607. El Tribunal ya ha mencionado que Ecuador no ha cuestionado la aseveración de la Demandante de que el Decreto 662 tenía como objetivo forzar la renegociación de los contratos de participación a fin de migrar a las contrapartes de Petroecuador a contratos de prestación de servicios. En la opinión del Tribunal, la modificación del 50% al 99%, con la aplicación del Decreto 662, implicó el incumplimiento del Artículo 4 del Tratado, *y las medidas recién enumeradas, consideradas en conjunto, también* constituyeron el incumplimiento del Artículo 4". [Doble énfasis agregado].

80. Tal como indican los fragmentos subrayados y en cursiva, el Tribunal distinguió entre el Decreto 662 y las medidas que le siguieron. Esto no implica sugerir que ninguna de estas se relacionaba con las otras, sino que el Tribunal era consciente del hecho de que algunos de los incumplimientos (y otros supuestos incumplimientos que no se aceptaron como tales) surgieron de interacciones complejas entre el Consorcio y/o los actos individuales de sus miembros, Perenco y Burlington, y el Estado[33].

81. Por lo tanto, los hechos y las conclusiones eran algo más complicados que la manera en la que han sido abordados en ocasiones en el curso de los escritos sobre *quantum*. En consecuencia, el Tribunal ha considerado necesario retomar conclusiones previas específicas cuando así lo disponga de modo de dotar de contexto a algunas conclusiones a las que se arribó en este Laudo.

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[33] La primera derivó en las coactivas destinadas a cobrar la deuda fiscal reclamada que el Tribunal ha concluido que constituye un incumplimiento contractual (en el párr. 579 de la Decisión sobre Responsabilidad, el Tribunal concluyó que no era necesario considerar a las medidas como un incumplimiento del tratado); se concluyó que la segunda constituía un incumplimiento, pero uno con el cual se concluyó que Perenco había contribuido; y se concluyó que la tercera, la intervención del Estado a fin de operar los Bloques, fue una respuesta lícita a la suspensión de las operaciones por parte de Perenco. Decisión sobre Responsabilidad, párrs. 417, 697 y 708.

82. Además de las cuestiones de contexto y oportunidad, el Tribunal considera que el Decreto 662 tuvo el efecto de convertir los Contratos de Participación en contratos de prestación de servicios *de facto* (y, tal como Perenco señalara durante la etapa de *quantum*, imperfectos en ese sentido, ya que no ofrecían protección alguna en contra de los precios inferiores del petróleo)[34], aunque el decreto no pretendía interferir en la operación de los Contratos por debajo del precio de referencia[35]. Perenco continuó tanto siendo titular de esos derechos contractuales como ejerciéndolos hasta la fecha de su decisión de suspender las operaciones (y, posteriormente, cuando Ecuador acreditó en la cuenta de Perenco ingresos obtenidos de las ventas de crudo mientras operaba los Bloques una vez que el Consorcio suspendiera las operaciones y hasta la declaración de caducidad)[36].

83. Por ende, el Tribunal no advirtió un conjunto de medidas interrelacionadas tan íntimamente ligadas en el tiempo como para convencerlo de juntarlas y emplear la fecha de valuación única que sostenía Perenco. Tampoco consideró que los desafíos de valorar los incumplimientos en forma individual fueran muy complejos como para requerir que el ejercicio de cálculo de daños utilice una fecha única de valuación de manera predeterminada.

84. Los tribunales no están obligados a aceptar la fecha de valuación propuesta por una parte. En el caso *Sempra*, por ejemplo, si bien el tribunal coincidió finalmente con la fecha propuesta por la demandante, decidió lo siguiente:

> "209. El Tribunal por consiguiente utilizará el 31 de diciembre de 2001 como la fecha correcta para la valoración. Ello no se debe a que el Tribunal

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34 Cl. Rep. Q., párr. 132.

35 Tal como se observara en un informe enviado por correo electrónico poco después de que los representantes de Perenco se reunieran con el Ministro de Minas: "Si perforamos el OSO23, debemos explicarle al Estado que esta es la última perforación que haremos y que la llevamos a cabo en virtud de una obligación contractual que tenemos con la contratista encargada de la perforación, y que, obviamente, resulta dificultoso detener una campaña de manera tan repentina. En otras palabras, no queremos que el Estado crea que no detenemos las perforaciones porque estas todavía son rentables para nosotros" [Traducción del Tribunal] [Énfasis agregado]. Anexo BR-26, correo electrónico de fecha 9 de octubre de 2007. *Véase Murphy Exploration and Production Company c. La República del Ecuador (II)*, Caso CPA No. 2012-16 (anteriormente, AA 434), Laudo Final Parcial, 6 de mayo de 2016, párrs. 276-280 (en lo sucesivo *Murphy c Ecuador*), que coincide con el enfoque adoptado por el Tribunal en su Decisión sobre Responsabilidad.

36 E-398, Tabla Actualizada – Subastas Bloque 7; E-399, Tabla Actualizada - Subastas Bloque 21.

> considere que el punto de vista de la Demandante debe ser objeto de alguna deferencia, sino simplemente al hecho de que la explicación dada muestra que hubo una decisión de invertir adoptada de buena fe. Tampoco el Tribunal comparte la interpretación de la Demandante acerca de una supuesta deferencia respecto a la elección de la fecha de valoración en el caso *CMS*. Es evidente que en el caso *CMS* ningún acto o decisión de la demandante posterior a la medida cautelar planteó duda alguna acerca de la fecha que desencadenó los hechos objeto de reclamación[37]".

85. En vista de todas las circunstancias y de sus conclusiones anteriores, el Tribunal, por lo tanto, prefiere el tipo de análisis de "estratificación" que proponen los peritos de Ecuador, aunque con modificaciones importantes al enfoque de Brattle. El Tribunal pretende valorar el primer incumplimiento completo y luego ajustarlo de determinadas maneras por las razones que se explicarán *infra*. A continuación, abordará los incumplimientos posteriores y hará lo mismo (si hay prueba de daño susceptible de evaluación financiera causado inmediatamente por cada incumplimiento). Considera que este enfoque se encuentra en consonancia con el derecho internacional y la práctica jurídica.

86. El Tribunal observa que, vinculado con el debate de las Partes sobre la 'estratificación', había argumentos en cuanto a si Brattle actuó de manera coherente con su intención declarada de valorar los incumplimientos por separado sobre una base *ex ante*. Perenco criticó a Brattle por haberse concentrado en los dos incumplimientos del Decreto 662 y de la caducidad especificados en la parte dispositiva de la Decisión sobre Responsabilidad sin estimar los efectos económicos de los incumplimientos intermedios (exigir que los contratos migraran a contratos de prestación de servicios, escalar las exigencias contractuales, así como hacer declaraciones amenazantes y coercitivas)[38]. Sin embargo, el Tribunal resaltaría que esta crítica pasa por alto el punto destacado en el párrafo [74] *supra*, según el cual a la demandada no le corresponde justificar la posición de la demandante en materia de daños, sino que la demandante tiene esa carga[39]. De hecho, la demandada tiene

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37 *Sempra Energy International c. República Argentina*, Caso CIADI No. ARB/02/16, Laudo, 28 de septiembre de 2007, párr. 209. *Véase también* EL-290, *Anatolie Stati, Gabriel Stati, Ascom Group S.A. y Terra Raf Trans Trading Ltd c. República de Kazajstán*, Caso CCE No. V116/2010, Laudo, 19 de diciembre de 2013, párrs. 1493-1498.

38 Cl. Rep. Q., párrs. 257-259.

39 *AIG Capital Partners, Inc. y CJSC Tema Real Estate Company c. República de Kazajstán*, Caso CIADI No. ARB/01/6, Laudo, 7 de octubre de 2003, párr. 12.1.9: "La carga de establecer mediante pruebas confiables

derecho a simplemente impugnar el enfoque de la demandante si considera apropiado hacerlo sin ofrecer una estimación alternativa de la indemnización de daños que podría pagarse. Perenco fue notificada del enfoque de 'estratificación' mediante el primer escrito de contestación de la Demandada en la etapa de daños[40]. El hecho de que Brattle no tratara de valorar las exigencias contractuales escaladas, por ejemplo, no impidió que Perenco intentara hacerlo[41]. No obstante, si bien criticó el enfoque de Brattle en su Réplica, Perenco continuó basando su posición en materia de daños en una fecha de valuación única, corriendo el riesgo de que el Tribunal pudiera verse persuadido por el enfoque de Brattle y, por consiguiente, no intentara valorar los incumplimientos que surgieron entre el Decreto 662 y la caducidad.

87. Otras críticas del enfoque de 'estratificación' de Brattle, tales como la observación de Perenco de que Brattle no se ciñó al enfoque *ex ante* declarado hacia la valuación del impacto del Decreto 662 en Perenco cuando Brattle utilizó información *ex post* para plantear su argumento del *true-up*, se abordarán *infra*.

88. Por su parte, Ecuador sostuvo que la diferencia suscitada entre las Partes evolucionó con el tiempo. Por lo tanto, argumentó que sus peritos estuvieron en lo correcto al estimar los efectos de incumplimientos separados que tuvieron lugar en distintos momentos en aras de

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el *quantum* de los daños o la compensación por la expropiación recaía y recae en las Demandantes" [Traducción del Tribunal]. *Véase también* CA-439, *Gemplus c. México*,, párrs. 13-80: "Corresponde a las Demandantes, por ser las que alegan tener derecho a tal indemnización, el establecer su monto: el principio *actori incumbit probatio* es '*la regla básica amplia para asignar la carga de la prueba en los procedimientos internacionales*'".

40 Brattle ER II, párrs. 43 y 254; Cl. Rep. Q., párrs. 257-269, en los que se realizan comentarios al respecto.

41 El Tribunal toma nota del Informe de Refutación de Brattle (Brattle ER III), en cuya nota al pie 83 se estableció lo siguiente: "El enfoque del Profesor Kalt hacia el cálculo *ex-ante* también sería incorrecto si aceptáramos la alternativa de que era posible cuantificar daños separados emergentes de los incumplimientos separados en el párr. 606. Este punto de vista solo daría lugar a la introducción de un estrato adicional en el análisis de daños a fin de reflejar el incumplimiento separado del TJE (que consideramos cuantificable) en la fecha de incumplimiento asociada. Este sería quizás el momento en el que, 'consideradas en su conjunto', las medidas identificadas en el párr. 606 de la Decisión sobre Responsabilidad constituirían un incumplimiento separado del estándar de TJE. Puesto que la Decisión sobre Responsabilidad no identificó ninguna de esas fechas, en particular, en la parte dispositiva, no hemos procedido a ese análisis. Es poco probable que la incorporación de un tercer estrato tenga un impacto sustancial en los daños causados a Perenco. Estamos dispuestos a introducir un tercer estrato en el análisis si el Tribunal así lo solicita en este sentido". [Traducción del Tribunal]

evitar la doble contabilidad. Brattle estimó el impacto del Decreto 662 al 4 de octubre de 2007 para luego estimar el impacto de la caducidad en el valor ya disminuido (pero también ya compensado) de los derechos de Perenco respecto de los Bloques.

89. Ecuador observó en este aspecto que la valuación de Brattle a la fecha del Decreto 662 era congruente con los cálculos contemporáneos realizados por Perenco en octubre de 2007, solo unos días después de la promulgación del Decreto 662. En cuanto a la Ley 42 al 50%, Perenco calculó que el VAN correspondiente a sus derechos respecto de los dos Bloques hasta su fecha de vencimiento ascendía a USD 239,4 millones[42]; el cálculo inicial del VAN por parte de Brattle respecto de los derechos ascendía a USD 265,7 millones[43], pero luego fue ajustado al alza en su Informe de Réplica hasta alcanzar USD 282,2 millones (utilizando los costos de capital de RPS) o USD 295,8 millones (utilizando los costos del Profesor Kalt). En relación con el Decreto 662, el cálculo contemporáneo del VAN por parte de Perenco correspondiente a sus derechos respecto de los dos Bloques ascendía a USD 154,6 millones[44]; los valores iniciales de Brattle ascendían a USD 107,7 millones[45] y Brattle luego los actualizó hasta alcanzar USD 127,6 millones (utilizando los costos de RPS) o USD 127,5 millones (utilizando los costos del Profesor Kalt).

90. Al cuestionar el intento de Ecuador de emplear una fecha anterior para el cálculo de la indemnización de daños, Perenco argumentó que la 'estratificación' era conceptualmente errónea en este caso porque los incumplimientos de Ecuador se encontraban interrelacionados. Esos incumplimientos interrelacionados hicieron que la estratificación fuera rechazada en el contexto del caso *SAUR*[46]. Aquí, cada uno de los incumplimientos de Ecuador se encontró íntimamente ligado a los otros (y, según Perenco, era irrelevante que el Tribunal no encontrara una expropiación gradual)[47]. El principio de reparación íntegra

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42 USD 122 millones para el Bloque 7 y USD 117 millones para el Bloque 21. Brattle ER II en nota al pie 157.

43 USD 111 millones para el Bloque 7 y USD 171 millones para el Bloque 21. Brattle ER II en nota al pie 157.

44 USD 84 millones para el Bloque 7 y USD 71 millones para el Bloque 21. Tabla M de Brattle.

45 USD 60 millones para el Bloque 7 y USD 68 millones para el Bloque 21. Tabla M de Brattle.

46 Cl. Rep. Q., párr. 264.

47 *Ibid.*,párr. 265.

justificaba el uso de una fecha de valuación única en aras de captar el efecto acumulativo de los incumplimientos y, así, otorgarle a Perenco una restitución adecuada. El enfoque de Brattle era inconsistente con el principio según el cual un Estado incumplidor no podría recibir crédito por actos que deprimieran el valor de la inversión con anterioridad a la expropiación (tal como se reconociera en el caso *Occidental II*)[48].

91. Perenco también argumentó que Brattle admitió haber aplicado la 'estratificación' de una manera que redujo los daños de Perenco una y otra vez. El Profesor Dow reconoció que, si la 'estratificación' se realizara en otro orden, el valor de los daños de Perenco sería más elevados[49]. Perenco admitió que el Profesor Dow y el Sr. Caldwell también reconocieron en el contrainterrogatorio que habían transferido esencialmente solo el riesgo "bueno" y le habían impuesto a Perenco el riesgo "malo": habían ignorado los elevados precios reales del petróleo con posterioridad al Decreto 662 al momento de estimar los ingresos proyectados de Perenco, pero reducido los daños de Perenco compensando los pagos reales en virtud del Decreto 662 sobre la base de esos precios del petróleo más elevados y luego privado a Perenco del precio de mercado real del petróleo incautado en virtud de las coactivas[50]. El enfoque de Brattle también presumía que, al momento de fijar un precio *ex ante*, un comprador interesado habría previsto la secuencia de acontecimientos posteriores en su totalidad—incluida, finalmente, la incautación del petróleo—aunque el Sr. Caldwell admitió que "nadie en octubre 2007 hubiese predicho toda esa cadena de eventos que tuvieron lugar posteriormente"[51].

92. Perenco agregó que los diversos escenarios de '*estabilización*' de Brattle no tenían sentido. El Profesor Dow y el Sr. Caldwell admitieron que su pago complementario de una suma a tanto alzado ('*side payment*') correspondiente al Decreto 662 implicaba continuar aplicándole el Decreto 662 a Perenco, si bien el propósito de la indemnización de daños

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48 Cl. PHB Q., párr. 20.

49 *Ibid.*, párr. 21.

50 Tr. Q. (5) 1467:13-19 (Dow); Tr. Q. (5) 1483:14-1485:19 (Caldwell); *véase también* Documentos de Trabajo de Brattle, Tabla P.

51 Tr. Q. (5) 1457:17-1459:1 (Caldwell); *véase también* Brattle ER II, párr. 53; *cf.* Tr. (5) 1480:8-10 (Caldwell).

consistía en eliminar los efectos del Decreto 662[52]. No podría asumirse que Perenco habría cedido todas sus ventajas futuras a cambio de un pago único en octubre de 2007. Asimismo, la noción de que las expectativas de Perenco eran inmutables a octubre de 2007 era inconsistente con el hecho de que Perenco continuara funcionando en Ecuador con posterioridad al Decreto 662.

93. Además, Brattle no había explicado el motivo por el cual cualquier '*umbral impositivo hipotético*' entre el 50% y el 99% era apropiado en absoluto cuando la tarea del Tribunal consistía en eliminar el Decreto 662 en su totalidad. Los escenarios de '*estabilización*' de Brattle tenían como premisa las variaciones de lo que, según Ecuador, eran las supuestas expectativas precontractuales de las partes, pero el Sr. Caldwell ni siquiera pudo articular el fundamento para utilizar dichas expectativas a fin de determinar la indemnización de daños a la que Perenco tenía derecho en virtud del Tratado[53].

94. Ecuador respondió a las alegaciones de Perenco del siguiente modo.

95. Primero, en la Audiencia sobre *Quantum*, Ecuador presentó el Gráfico de Cascada que mostraba los distintos componentes de daños reclamados por Perenco e ilustraba el impacto de corregir cada componente[54]. Perenco no impugnó las cifras consignadas en el Gráfico de Cascada[55].

96. Segundo, en respuesta a la crítica de Perenco según la cual la 'estratificación' era inválida debido a la naturaleza interrelacionada de los incumplimientos de Ecuador, Perenco no explicó el motivo por el cual los incumplimientos se encontraban interrelacionados y la interrelación tendría importancia a efectos de la 'estratificación'[56]. El Profesor Kalt reconoció por primera vez durante la Audiencia sobre *Quantum* que él mismo había

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52 Tr. (5) 1457:17- 1459:2 (Dow); *ibid.* 1517:2-10, 1517:22-1518:9 (Caldwell); *cf. id.*1224:20-1225:5, 1229:14-1241:11 (Kalt).

53 Tr. (5) 1514:21-1515:22 (Caldwell) (que declaraba que era una cuestión de instrucción).

54 Brattle ER III, Figura 16.

55 Resp. PHB Q., párr. 138.

56 Resp. Rep. PHB Q., párr. 101(i).

realizado una estratificación mensual en su análisis *ex ante*, que contradecía su propia crítica y la de Perenco respecto de la 'estratificación'[57]. La justificación de contratos contingentes entre mercados del Profesor Kalt correspondiente a su cálculo *ex ante* resultó totalmente novedosa en la Audiencia sobre *Quantum* y completamente diferente de la lógica planteada en su Cuarto Informe Pericial[58].

97. Con respecto a la crítica de Perenco según la cual ni Ecuador ni Brattle trataron el hecho de que el Tribunal encontró otros incumplimientos además del Decreto 662 y de la caducidad, Ecuador afirmó que el Informe Pericial de del 16 de octubre de 2015 (en los párrafos 88 a 90) abordó esto *in extenso*, y Perenco eligió no someter a contrainterrogatorio a los testigos de Brattle sobre este punto durante la Audiencia sobre *Quantum*[59].

98. En cuanto al rechazo de la estratificación en *SAUR*, Ecuador explicó que ese tribunal rechazó la estratificación porque, en ese caso, el primer incumplimiento en el tiempo ya había privado a la inversión de todo valor, lo que no ocurrió aquí[60]. En el caso *Occidental II*, los dos incumplimientos que encontró el tribunal estaban separados solo por unas semanas, y, por ende, la cuestión ni siquiera se analizó[61]. Por el contrario, en el presente caso, los dos incumplimientos principales tuvieron lugar en los años 2007 y 2010.

99. Por último, con respecto a la afirmación de Perenco de que Brattle había admitido haber aplicado la estratificación de una manera que redujo los daños de Perenco una y otra vez, Ecuador argumentó que esto ilustraba la confusión de economía bastante simple de Perenco. La única crítica de Perenco se dirigía al cálculo del '*true-up*' por parte de Brattle, que fue *ex post* (es decir, considerando los precios reales) al mismo tiempo que calculaba los daños causados a Perenco *ex ante*. Tal como explicara Brattle, "el *true-up* adopta una perspectiva inherentemente *ex-post*, en tanto debe mirar hacia atrás y evaluar los montos en virtud de la Ley 42 que el Consorcio pagó efectivamente y los gravámenes que continúan

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57 Tr. Q. (5) 1415:20-1416:22 (Kalt).

58 Resp. Rep. PHB Q., párr. 101(i); *cf.* Cl. PHB Q., párr. 18 y Kalt ER IV, párrs. 47-52.

59 Resp. Rep. PHB Q., párr. 101(ii).

60 *Ibid.*, párr. 101(iii).

61 *Ibid.*, párr. 101(iv).

pendientes"[62]. Este cálculo no tenía nada de endeble, y el Profesor Kalt nunca discrepó con él. Brattle también explicó que correspondía imponerle a Perenco el cambio en los precios del petróleo cuando optó por retener impuestos, al mismo tiempo que reconoció que, en definitiva, la asignación de los riesgos era una cuestión que debía resolver el Tribunal (de ahí los cálculos de sensibilidad del '*true-up*').

100. Tal como se observara en el párrafo 77 *supra*, el Tribunal ha decidido que corresponde intentar cuantificar los daños causados por distintos incumplimientos que tuvieron lugar en distintos momentos. Si el Tribunal acepta que la manera en la que Brattle realizó el ejercicio presenta deficiencias, estas podrán subsanarse en el cálculo de la indemnización de daños.

101. Tras concluir esto, el Tribunal destaca asimismo a esta altura que Perenco también había sostenido, conjuntamente con su enfoque de fecha de valuación única, que debería adoptarse un enfoque *ex post* cuando hubiera una expropiación ilícita y el valor de la inversión hubiera aumentado[63]. Ecuador disintió. A la luz del análisis del Tribunal *supra* y de su enfoque de estratificación / "estado financiero limpio" (que se analizarán *infra*), el Tribunal considera que no es necesario profundizar en los argumentos sobre este punto.

2. ¿Perenco ha probado alguna pérdida o daño inmediatamente causados por las violaciones del trato justo y equitativo posteriores al Decreto 662?

102. Tal como se indica en los párrafos 74 y 85 *supra*, el Tribunal otorgará una indemnización de daños y perjuicios en ocasión de cualquier pérdida financiera cuantificable causada inmediatamente por los incumplimientos que este determinare en la etapa del fondo. La indemnización de daños y perjuicios se otorgará en virtud del Decreto 662 y de la declaración de caducidad. Esto plantea la cuestión de si se ha demostrado o no que las otras

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62 Brattle ER II (4 de mayo de 2015; errata de fecha 2 de junio de 2015), párr. 53. [Traducción del Tribunal]

63 *Véase* Cl. PHB Q., párr. 7, que cita CA-1, *ADC Affiliate Limited c. Hungría*, Caso CIADI No. ARB/03/16, Laudo del Tribunal, 27 de setiembre de 2006, párrs. 496 y 497; CA-438, *Ioannis Kardassopoulos c. Georgia*, Casos CIADI Nos. ARB/05/18 y ARB/07/15, Laudo, 3 de marzo de 2010, párr. 514, CA-444. *ConocoPhillips c. Venezuela*, Caso CIADI No. ARB/07/30, Decisión sobre Jurisdicción y Fondo, 3 de septiembre de 2013, párr. 343; CA-447, *Yukos Universal Limited c. La Federación Rusa*, Caso CPA No. AA 227, Laudo Definitivo, 18 de julio de 2014, párr. 1767; EL-327 y *Quiborax c. Bolivia*, Caso CIADI No. ARB/06/2, Laudo, 16 de septiembre de 2015, párrs. 370 *y ss.*

violaciones del trato justo y equitativo incurridas en perjuicio de Perenco con posterioridad al Decreto 662 pero antes de la expropiación han provocado un daño cognoscible.

103. Para recordarlo, estos incumplimientos son: "(i) la exigencia de que los contratistas acordaran abandonar sus derechos que surgían de los contratos de participación y que migraran a lo que por un considerable período fue un modelo no específico, a punto tal que los contratistas no podían discernir precisamente qué se les pedía que adoptaran; (ii) escalar las exigencias de negociación, en especial en abril de 2008, cuando el Presidente inesperadamente suspendió las negociaciones y rechazó lo que recientemente había sido acordado en un Acuerdo Parcial respecto de uno de los bloques; (iii) hacer declaraciones amenazantes y coercitivas, incluidas amenazas de expulsión de Ecuador; y (iv) tomar pasos para aplicar la Ley 42 contra Perenco (y Burlington) por falta de pago de valores que se reclamaba que se adeudaban, una porción de los cuales se ha sostenido que incumplía el Artículo 4, y cuando no se efectuó pago alguno, incautar y vender por la fuerza el petróleo producido en los Bloques 7 y 21 a fin de cobrar la deuda reclamada en virtud de la Ley 42"[64].

104. Sin embargo, con excepción de las ventas del crudo incautado y vendido con arreglo a las medidas coactivas, que deben ajustarse en el ejercicio del '*true-up*' de manera consistente con la conclusión del Tribunal respecto del Decreto 662, parece que los peritos de ninguna de las Partes asumieron la tarea de cuantificar los daños imputables a dichos incumplimientos durante la etapa escrita del procedimiento. Por lo tanto, puede ser que no se haya calculado el daño inmediato derivado de estos incumplimientos y, por ende, no se pueda otorgar indemnización alguna[65]. Esta es la posición asumida por The Brattle Group[66].

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64 Decisión sobre Responsabilidad, párr. 606.

65 Perenco criticó el enfoque estratificado de Brattle por solo haber calculado el impacto del Decreto 662 y de la caducidad. El Tribunal entiende que el Profesor Kalt también criticó la estratificación, pero no ofreció cuantificación alguna de los daños provocados por estos incumplimientos, y tampoco probó que efectivamente ocurrieron, ni cuándo.

66 Brattle ER III, párr. 90.

105. El Tribunal entiende que la opinión del Profesor Kalt consiste en que los incumplimientos (i) y (iii) que se detallan *supra* "previsiblemente causarán un perjuicio en la inversión y en las decisiones de producción de Perenco"[67]. El Tribunal está de acuerdo, pero también considera que este perjuicio ya se produjo cuando entró en vigor el Decreto 662 y Perenco detuvo las perforaciones en ambos Bloques (salvo en Oso 23). Dado que el Tribunal ha concluido que los pozos se habrían perforado en ambos Bloques con posterioridad al Decreto 662 y que se indemnizaría a Perenco por los flujos de caja correspondientes a esos pozos 'contrafácticos' así como por la pérdida de la chance de negociar la prórroga del Bloque 7 (véanse las Secciones II.D.3 and II.F i*nfra*), en opinión del Tribunal, se cumplen las consideraciones del Profesor Kalt sobre estos puntos particulares.

106. En cuanto a las coactivas, el Tribunal reflejará en el Laudo una suma en concepto de indemnización de los daños y perjuicios derivados de la imputación a Perenco del bajo precio de subasta recibido por el crudo incautado en lugar del valor de mercado. Las Partes le dedicaron un tiempo considerable durante el transcurso de este procedimiento al impacto de las coactivas. Hay evidencia en el expediente de la cantidad de crudo incautado, los precios al que fue vendido y las sumas que le fueron abonadas a Perenco. Sin embargo, el análisis se torna dificultoso por el hecho de que, luego de someter su reclamo a un procedimiento de arbitraje, Perenco (y Burlington) dejaron de pagar los valores exigidos por la Ley 42 y, en su lugar, comenzaron a depositarlos en una cuenta ubicada fuera de Ecuador. Dado que Perenco no logró probar el incumplimiento contractual y del Tratado derivado de la Ley 42 al 50%, el Tribunal considera que el reclamo de '*true-up*' de Ecuador tiene cierto fundamento. Se deduce que se debe efectuar cierta contabilidad sobre el incumplimiento de la Ley 42 por parte de Perenco. En opinión del Tribunal, la cuestión se aborda de una mejor manera como parte del análisis respecto del reclamo de '*true-up*' de Ecuador *infra*.

107. En síntesis, el Tribunal considera que el impacto financiero de los incumplimientos ajenos al Decreto 662 o bien se ha contabilizado en el análisis 'contrafáctico' del Decreto 662 al

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67 Kalt ER IV, párr. 49. [Traducción del Tribunal]

4 de octubre de 2007 o no fue cuantificado en los informes periciales presentados con los escritos sobre *quantum* de la Demandante.

3. Uso de un 'estado financiero limpio' para la valuación de los daños causados por la expropiación

108. El Tribunal ha admitido la alegación en la que Ecuador sostiene que el uso de una fecha única para calcular los daños no resulta apropiado a las circunstancias del presente caso. El Tribunal recuerda que Brattle justificó su enfoque 'estratificado' sobre la base de la necesidad de protegerse de la doble contabilidad:

> "Entonces estimamos el VJM de los derechos de Perenco en julio de 2010, cuando Ecuador declaró la Caducidad. El Tribunal consideró que la Caducidad configuraba una expropiación. Descontamos el impacto del Decreto 662 en nuestro estimado de julio de 2010 del VJM de los derechos de Perenco, que refleja nuestra cuantificación separada de los daños adeudados en relación con el impacto en la primera etapa. El descuento del impacto del Decreto 662 era necesario para evitar la doble contabilización[68]".

109. El Tribunal está de acuerdo con que debe evitarse la doble contabilización, pero ha arribado a una solución diferente de la que propuso Brattle.

110. Esto se debe a que el Tribunal considera que está fundamentada la preocupación de Perenco respecto de que la estimación de los daños a partir del momento en que se produjeron todos los efectos del primer incumplimiento completo podría ser injusta para ella. Dependiendo de cómo se calcule la compensación del primer incumplimiento completo, es posible, tal como sostuvo el Profesor Kalt, que la contabilización de los efectos del Decreto 662 deprima el precio de los derechos de Perenco que finalmente fueron expropiados.

111. Luego de haber analizado minuciosamente las presentaciones de las Partes, el Tribunal ha concluido que el enfoque más justo a adoptar en consideración de las circunstancias del presente caso es el siguiente: dado que, a la fecha del primer incumplimiento, no era para nada seguro que aproximadamente 33 meses más tarde tendría lugar una expropiación con posterioridad al dictado del Decreto 662, el Tribunal calculará los daños que fueron

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[68] Brattle ER III, párr. 67(b). [Traducción del Tribunal]

causados de manera inmediata por el Decreto 662 para el periodo comprendido entre el 4 de octubre de 2007 y el 20 de julio de 2010. Esto se debe a que el Decreto 662 fue el único incumplimiento indemnizable para ese período.

112. Para empezar, el Tribunal también habría otorgado una indemnización por todos los daños causados de manera inmediata por las posteriores violaciones del trato justo y equitativo, pero ya ha determinado que la Demandante no aportó evidencia alguna que pruebe el impacto financiero de las violaciones del trato justo y equitativo posteriores al dictado del Decreto 662. Por lo tanto, no se puede otorgar indemnización alguna por los daños producidos por esos incumplimientos. Pero dado que los derechos de Perenco se extinguieron en razón de la caducidad, el Tribunal volverá a calcular la pérdida de esos derechos de conformidad con las condiciones de mercado y las expectativas de la industria de ese momento (así como a la luz de la hipotética producción incrementada de los dos Bloques en el escenario 'contrafáctico').

113. Tras adoptar este enfoque, la primera consideración del Tribunal fue que esto se haría sobre la base de la relación entre la cantidad total de meses transcurridos entre los meses de octubre de 2007 y julio de 2010, y la cantidad total de meses transcurridos entre octubre de 2010 y la fecha de vencimiento del plazo contractual. Sin embargo, un simple prorrateo temporal llevaría a un resultado sesgado que podría asignarle un valor menor que el real a los flujos de caja que se habrían generado durante el periodo comprendido entre los meses de octubre de 2007 y julio de 2010[69]. En estas circunstancias, por lo tanto, el Tribunal ha sumado los flujos de caja descontados en el modelo de daños de octubre de 2007 hasta julio de 2010. Esto garantiza que el valor del conjunto de daños correspondiente a octubre de 2007 refleje el descuento y la contribución reales correspondientes a los flujos de caja

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69 Esto se debe al hecho de que un enfoque de prorrateo asumiría implícitamente que el valor producido por el campo fue constante cada mes durante la vida del campo. El descuento sobreestimaría los flujos de caja que están más cercanos en el tiempo respecto de aquellos que se encuentran más a futuro. Además, el valor generalmente es fijado con una comisión de entrada dado que las tasas de producción usualmente empiezan altas y disminuyen con el tiempo. Los perfiles que disminuyen redundan en mayores ingresos y flujos de caja más temprano que tarde durante la vida del campo. El prorrateo también causaría problemas con respecto al modelo de los gastos de capital.

anteriores a julio de 2010 respecto del valor justo de mercado de octubre de 2007 y también que se contabilice el costo total de cualquier CAPEX previo a julio de 2010.

114. El resultado es una indemnización inicial de los daños causados por el impacto del Decreto 662 durante el período de casi 33 meses transcurridos entre el primer incumplimiento completo y el último. Entonces, se efectúa una nueva valuación a la luz del efecto de la expropiación, sobre la base de la información de mercado y precios disponibles a la fecha de la expropiación. La indemnización inicial de daños imputable al Decreto 662 tiene un tope en ese punto; esto requiere entonces que el Tribunal efectúe ciertas determinaciones en cuanto a la naturaleza de los derechos contractuales que se extinguieron. Estas se encuentran incluidas en el cálculo y el valor del derecho mensual respecto del Bloque 7 así como se calculará para el período restante de aproximadamente 10 años del Bloque 21.

115. El Tribunal ha adoptado este enfoque porque acepta la preocupación del Profesor Kalt respecto de la valuación de un activo cuyo valor ya se ha visto disminuido. Por consiguiente, en lugar de valorar lo que se denominaría el 'precio inferior al de referencia' de los derechos contractuales, en teoría compensados en virtud de la indemnización anterior, el Tribunal establecerá una nueva valuación de la totalidad de los derechos contractuales que le fueron quitados a Perenco al día anterior a la fecha de expropiación, sobre la base de las condiciones de mercado existentes. Este análisis será efectuado *ex ante*, pero le permitirá al Tribunal considerar todos los desarrollos de mercado reales pertinentes, así como emplear las presunciones sobre lo que Perenco habría hecho en ambos Bloques durante el período anterior y lo que habría hecho en el período restante de las vidas útiles de los Bloques.

116. A diferencia de la situación en el caso *ADC c. Hungría*, donde el valor de la concesión de los derechos aeroportuarios controvertidos se había cristalizado luego de la presentación de un reclamo de arbitraje y con anterioridad a la fecha del laudo[70], el Tribunal se encuentra entre un período que se extiende desde la caducidad hasta la fecha de vencimiento del plazo

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[70] *ADC Affiliate Limited y ADC & ADMC Management Limited c. República de Hungría*, Caso CIADI No. ARB/03/16, Laudo, 2 de octubre de 2006.

contractual. Considerando el extenso debate sostenido entre las Partes con respecto al uso de información sobre valuación *ex ante* o *ex post*, el Tribunal es consciente del grado de arbitrariedad que subyace al empleo de la fecha del Laudo como la fecha de valuación dado que un solo hecho sustancial puede tener efectos drásticos en la valuación dada la volatilidad del mercado del crudo. En las circunstancias de este caso, el Tribunal empleará un enfoque *ex ante* de comprador y vendedor interesados utilizando el precio del crudo existente a la fecha de la expropiación (aproximadamente USD 76 por cada barril de crudo WTI (*West Texas Intermediate*) a julio de 2010).

117. En línea con las conclusiones de que:

(i) no hubo incumplimientos relacionados entre sí como para justificar el uso de una fecha única para la valuación[71];

(ii) es apropiado, en principio, pretender valorar los daños causados por los diferentes incumplimientos que ocurrieron en los momentos pertinentes; y

(iii) la prueba contemporánea del valor es una verificación de utilidad para las estimaciones del Tribunal;

el Tribunal considera que un enfoque que utilice el aceptado enfoque *ex ante* para la valuación como principal punto de referencia es razonable y apropiado en estas circunstancias. (Utiliza la palabra "*principal*" por el hecho de que, con el paso del tiempo transcurrido entre el inicio de este arbitraje y el dictado del Laudo, Petroamazonas ha operado en los Bloques, e, inevitablemente, la prueba testimonial y pericial relativa a la operación del Bloque 21 en especial, ha mezclado información *ex ante* y *ex post*. En tales circunstancias, el Tribunal no tiene interés alguno en abocarse a la tarea de 'poner las cosas en orden' trazando una diferencia estricta entre estos tipos de información).

4. El Rol de la Prueba Contemporánea del Valor

118. El Tribunal está convencido de que el enfoque que se debe adoptar a la luz de las circunstancias del caso consiste en el cálculo de los daños imputables a cada incumplimiento por separado y en orden cronológico, gracias a la disponibilidad de los

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71 *Véase* Sección II.C.1 Fecha de Valuación *supra*.

cálculos contemporáneos de Perenco del valor actual neto (VAN) del impacto de la Ley 42 tanto al 50% como al 99% en ambos Bloques. Estos cálculos se efectuaron inmediatamente después del anuncio del Decreto 662[72]. Por ejemplo, la hoja de cálculo correspondiente al Bloque 21, que fue divulgada por Perenco en la etapa de exhibición de documentos y revisada por Brattle, demuestra que el cálculo del VAN del Bloque 21 se extendía, previsiblemente, hasta la fecha de vencimiento del Contrato correspondiente al Bloque 21 del año 2021[73].

119. Estos documentos confeccionados por la Demandante constituyen, en opinión del Tribunal, prueba suficiente del valor estimado de los Bloques con la Ley 42 al 50% y al 99% a la luz de las circunstancias de mercado existentes y previstas a la fecha del primer incumplimiento. Brattle estudió y ajustó los cálculos de Perenco; Perenco, por ejemplo, había utilizado los precios del crudo de WTI correspondientes a julio de 2007 en lugar de los precios más elevados correspondientes a principios de octubre de 2007. De hecho, Brattle terminó arribando a un cálculo del VAN algo más elevado que aquel efectuado por Perenco en ese momento[74].

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72 Anexo BR-26.

73 Anexo BR-27 (Impacto de la Ley 42 al 99% en el VAN); Anexo BR-28 (Impacto de la Ley 42 al 50% en el VAN).

74 *Véase* Brattle ER II, párr. 253: "El cálculo de la indemnización de daños y perjuicios para la economía de este escenario del contrato se asemeja al análisis financiero realizado por Perenco en octubre de 2007, inmediatamente después de la publicación del Decreto 662. Calculamos que el Decreto 662 de octubre de 2007 redujo en USD 158 millones el valor justo de mercado de los derechos de Perenco en los Bloques 7 y 21 (sin inclusión de los intereses calculados antes del dictado de la sentencia), menos del doble de los USD 85 millones calculados por Perenco a la fecha". Esto se detalla en la nota al pie 157 del mismo párr.: "La estimación de Perenco de USD 84,8 millones figura en un correo electrónico de Jerome García de fecha 9 de octubre de 2007. Con la Ley 42 al 50%, estimamos el valor justo de mercado correspondiente a octubre de 2007 en USD 109,1 millones para el Bloque 7 y USD 156,6 millones para el Bloque 21. Esto es comparable con los USD 122,1 millones para el Bloque 7 y los USD 117,3 millones para el Bloque 21 indicados en el correo electrónico de Jerome García. En el Bloque 21 (donde tenemos los modelos de Perenco), asumimos precios y costos más elevados que los que se incluyen en los modelos de Perenco (PERPROD0032725 (Anexo BR-27) y PERPROD0032726 (Anexo BR-28)), y una mayor producción. Con el Decreto 662, estimamos un valor justo de mercado correspondiente a octubre de 2007 de USD 58,8 millones para el Bloque 7 y 48,9 millones para el Bloque 21. Esto es comparable con los USD 84,1 millones para el Bloque 7 y los USD 70,5 millones para el Bloque 21 calculados por Perenco en ese momento. Teniendo en cuenta el Decreto 662, nuestra estimación del valor justo de mercado para el Bloque 21 es más baja que la de Perenco porque nuestro modelo incluye costos operativos más altos". [Traducción del Tribunal]

120. En su Escrito de Réplica Posterior a la Audiencia, Perenco les restó importancia a sus cálculos del VAN, describiéndolos como "*cálculos aproximados y apresurados que fueron realizados para comprender el impacto inmediato del Decreto 662*"[75].

121. Ecuador ya se había referido a esta afirmación en su alegato de clausura durante el Cierre sobre *Quantum* del 21 de abril de 2016 celebrada en La Haya. Las diapositivas 122 y 123 de la presentación de Ecuador demostraron que los cálculos eran estrechamente comparables a otras valuaciones realizadas por Perenco con anterioridad a la entrada en vigor del Decreto 662, relativas al valor de los Bloques e incluso, en uno de los casos, al monto que Perenco –*en calidad de posible compradora interesada*– podría estar dispuesta a pagarle a Burlington por los derechos que esta última tenía respecto de los Bloques con solo un mes de anterioridad a la promulgación del Decreto 662[76]. La presentación de los abogados reza lo siguiente:

> "Esto confirma que estos cálculos supuestamente apresurados realizados en el BR-26 no son tales. Esto surge de una valuación de septiembre 2007, que es algo congruente y se trata de un elemento mucho más alto que la de marzo de 2007. Esto fue preparado con mucho tiempo y no fue preparado en forma apresurada. Vean en la tabla que nosotros pusimos también la valuación de Brattle del Bloque 7 de 111,3 millones de dólares. Y si vemos las valuaciones de Perenco de octubre y septiembre de 2007, veremos que son más altas que las de marzo de 2007.
> Aquí tenemos el Bloque 21"[77].

122. El Tribunal considera que los analistas de Perenco habrían tenido una comprensión preliminar acertada del impacto del Decreto 662 en los derechos de la compañía respecto de los Bloques. La lista de distribución de la cadena de correos electrónicos contiene los nombres de siete empleados de Perenco que participaron del análisis del Decreto 662, con inclusión de Eric d'Argentré, Gerente de País de Perenco en Ecuador. Evidentemente, estos cálculos estaban basados en la información de la que la compañía disponía en ese momento.

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75 Cl. Rep. PHB Q., párr. 73. [Traducción del Tribunal]

76 Tr. Q. (2) 367:11–17 (Contrainterrogatorio de Combe): "Este es un documento de compra. Quería decir que yo no participé en esto entonces mi opinión puede ser distinta a la de Paddy, Paddy era el gerente de nuevos negocios. Así que yo supondría un caso de nivel más bajo. Así que, si Conoco no estaba poniendo ningún valor a la prórroga entonces no ofreceríamos ningún valor adicional".

77 Tr. Q. (6) 222:10-22 (Alegato de clausura de la Demandada).

Este es necesariamente un caso de proyección a futuro con un nuevo factor incorporado a la mezcla. Pero las proyecciones estaban siendo efectuadas por empleados que tenían conocimiento de (i) las cláusulas de los Contratos de Participación; (ii) el rendimiento de los Bloques a la fecha además de sus características y potencial; (iii) las intenciones de Perenco y del Consorcio; y (iv) las expectativas de mercado más amplias de la industria en ese momento.

123. Durante 2007, en los meses anteriores al Decreto 662, Perenco: (i) cumplió con la presentación de sus Expectativas a Mediano Plazo en marzo; (ii) valuó los derechos de Burlington respecto de los Bloques con vista a una posible adquisición en septiembre; y (iii) analizó el efecto del Decreto 662 en octubre de 2007[78]. El Tribunal observa que el Profesor Kalt comentó en su informe pericial de diciembre de 2014 que, en su experiencia, "*los inversores en propiedades y contratos de petróleo y gas utilizan sistemáticamente el método de flujo de caja descontado (FCD) en el curso de las actividades comerciales en aras de contar con mediciones respecto de en qué medida deberían valorar una inversión y, en ciertos casos, cuánto deberían estar dispuestos a pagar, o cuánto debería pagárseles, por los proyectos de desarrollo de petróleo y gas*"[79]. El Tribunal acepta lo antedicho y, por lo tanto, tiende a utilizar el análisis contemporáneo del impacto del Decreto 662 confeccionado por Perenco como verificación de su propia estimación del valor de los Bloques.

124. El Profesor Kalt originalmente había declarado que recordaba haber visto los cálculos internos de Perenco del efecto causado por la Ley 42 al 50% y al 99% en sus derechos respecto de los Bloques, pero luego declaró que *no* estaba seguro de haber visto las hojas de cálculo de Perenco. En cualquier caso, sostuvo que no le parecía pertinente abordarlas en sus informes[80]. Su postura resulta entendible ya que es consistente con su opinión de

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78 Anexo BR-27 y Anexo BR-28, Análisis de la hoja de cálculo para el Bloque 21, que también se adjuntó a Anexo BR-26, PERPROD0032722 (correos electrónicos intercambiados internamente sobre el impacto de la Ley 42 al 99%).

79 Kalt ER III, párr. 54. [Traducción del Tribunal]

80 Tr. Q. (5) 1333:5-1334:3 (Kalt). "P: ¿Cree usted que este correo refleja lo que Perenco pensaba en ese momento si hubiesen pedido continuar en el contrato? R: No sé, seguramente han realizado un análisis de ese

que debería adoptarse el enfoque de 'fecha única'. Puesto que el Tribunal no ha adoptado el enfoque de 'fecha única', considera que los cálculos del VAN de Perenco configuran prueba suficiente de su opinión sobre los valores de los Bloques en octubre de 2007 teniendo en cuenta o no la Ley 42 al 99%. Evidentemente, ese valor cambiaría con el tiempo dependiendo de varios factores, pero es una manera apropiada de verificar los resultados a los que arriba el Tribunal.

5. Resumen del Enfoque General del Tribunal

125. Por los motivos que anteceden, el punto de partida es la opinión del Tribunal de que se deben cuantificar los daños causados inmediatamente por cada incumplimiento y de que esto se debe realizar sobre la base de la fecha en la que dichos daños ocurrieron. Por consiguiente, el Tribunal considera, fundamentalmente de un modo *ex ante* (y, siempre que fuera posible, con referencia a la prueba contemporánea):

(i) el impacto financiero del Decreto 662 en los derechos de Perenco respecto de los Bloques a la fecha del primer incumplimiento completo, a saber, 4 de octubre de 2007, en aras de estimar la compensación que corresponde por el daño causado por dicho incumplimiento;

(ii) y, en relación con lo que antecede, el impacto específico del Decreto 662 en los planes de perforación de Perenco a esa fecha en aras de estimar lo que habría sucedido en el escenario 'contrafáctico' hasta la fecha de vencimiento del plazo del contrato en ambos Bloques (dado que esta cuestión es fundamental para los niveles de producción esperados y, por ende, para las proyecciones de los flujos de caja del escenario 'contrafáctico');

(iii) la indemnización a la que Perenco tiene derecho como consecuencia de la extinción de sus derechos contractuales respecto de los Bloques 7 y 21;

(iv) la cuestión que consiste en determinar si, en el escenario 'contrafáctico', Perenco habría obtenido una prórroga de sus derechos de operación respecto del Bloque 7 con posterioridad al 7 de agosto de 2010;

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tipo. Pero no le puedo decir aquí cuáles son todas estas presunciones, todos estos supuestos, están tratando de entender algo sobre el impacto del decreto 662 claramente, pero desconozco todos estos supuestos... P: … ¿vio usted alguna vez una copia de estas hojas de cálculo? R: No sé. No lo recuerdo".

(v) las alegaciones de '*true-up*' de Ecuador que sirven para determinar si debe actualizarse alguno de los daños calculados en virtud de las consideraciones precedentes; y

(vi) las tasas de interés aplicables (a la fecha del Laudo y a la fecha del pago del Laudo).

126. Sobre la base de las diversas conclusiones que ha expresado, el Tribunal determinará el *quantum* de los daños que debe otorgársele a Perenco mediante la utilización de un 'modelo equilibrado' que resulte del trabajo de los peritos financieros de ambas partes.

D. El *Quantum* de los Daños Causados por el Decreto 662, el Primer Incumplimiento Completo

127. El Tribunal no confirmó la existencia de ningún incumplimiento contractual o de un tratado en la Ley 42 al 50% y, por lo tanto, no se puede otorgar indemnización alguna sobre la base de los valores al 50% de la Ley 42, al menos no hasta la promulgación del Decreto 662, por el simple hecho de que no se cometió hecho ilícito alguno al 4 de octubre de 2007[81]. La cuestión que debe determinarse consiste en si el análisis resulta distinto a partir de esa fecha, y, en ese caso, de qué manera. Esto afecta el análisis del programa de perforación y, en consecuencia, el volumen de petróleo producido en el escenario 'contrafáctico'.

1. Economía de los contratos – La cuestión de si el impacto de la Ley 42 habría sido completamente absorbido

(a) Posición de Perenco

128. Perenco sostuvo que la economía de los Contratos consistía en la negociación contractual específica reflejada en las cláusulas de economía de los mismos Contratos, que garantizó la exposición total de Perenco a los precios del crudo independientemente de la TIR[82]. Tanto el Dr. Pérez Loose como el Profesor Aguilar estuvieron de acuerdo en que, conforme al derecho ecuatoriano, la '*economía*' de un contrato especifica el equilibrio entre derechos

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81 Tal como establece el Artículo 31(2) de la CDI, que versa sobre la Reparación: "El perjuicio comprende todo daño, tanto material como moral, *causado por el hecho internacionalmente ilícito* del Estado". El Comentario (9) indica, en este sentido, que '[s]ólo debe repararse íntegramente 'el perjuicio... causado por el hecho internacionalmente ilícito del Estado'". [Énfasis agregado]

82 Cl. PHB Q., párr. 58.

y obligaciones que determinaba los beneficios económicos que les corresponden a las partes en virtud del contrato[83]. Esto también definía los riesgos que asumiría cada parte durante la ejecución del contrato[84].

129. La prueba confirmó que la Ley 42 produjo la operatividad de las cláusulas. Perenco habría ejercido sus derechos de '*absorción*' en un escenario 'contrafáctico'. El Tribunal debe suponer que Ecuador habría cumplido sus obligaciones legales de buena fe.

130. Perenco sostuvo que no había perdido sus derechos de '*absorción*' ni a razón del principio de cosa juzgada ni a razón de una renuncia. En primer lugar, el Tribunal no ha decidido expresamente sobre la cuestión ni tampoco la ha rechazado. El Tribunal solo arribó a la conclusión de que Perenco no había demostrado que Ecuador hubiere violado los derechos de '*absorción*' de Perenco con anterioridad al Decreto 662. El argumento de Ecuador respecto de que la decisión del Tribunal de desestimar el reclamo de Perenco de que era inútil ejercer sus derechos cuando la Ley 42 se aplicaba al 50% debería aplicarse *mutatis mutandis* a la situación en la cual la Ley 42 se aplicaba al 99%, es incorrecto porque el Tribunal resolvió que exigir el cumplimiento de las cláusulas de hecho resultaba inútil con posterioridad al Decreto 662.

131. En segundo lugar, Perenco no había renunciado a esos derechos. Perenco había abonado los valores exigidos por la Ley 42 'bajo protesta'. Había invocado las Cláusulas de Renegociación en sus cartas de diciembre de 2006. Perenco también alegó incumplimiento de las cláusulas en este arbitraje. Incluso si Perenco no hubiere empleado sus mejores esfuerzos al invocar las cláusulas en relación con la Ley 42 al 50%, esto no constituiría una renuncia a los derechos que le asisten en virtud del derecho ecuatoriano. El testimonio del Dr. Pérez Loose en el que señala que Perenco no estaba obligada de modo alguno a ejercer sus derechos dentro de un plazo determinado no fue objetado[85]. La prueba presentada por los peritos de Perenco y sus testimonios también confirmaron que Perenco persistió en su

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83 *Ibid.*, 59.

84 *Id.*

85 Cl. PHB Q., párr. 108, que cita Tr. Q. (3) 869:9-13 (Pérez Loose); Loose ER VI, párrs. 25-27.

intento de entablar conversaciones con Ecuador por diversas vías. La derogación de la Ley 42 fue uno de los objetivos claves que el Gerente General de Perenco estableció para el equipo de Ecuador en el año 2007[86]. Los Sres. Combe y d'Argentré testificaron que no pretendían seguir haciendo valer los derechos de absorción de Perenco, sino que estaban intentando encontrar el momento adecuado para hacerlo[87], lo que fue confirmado por el Sr. Márquez[88].

132. El argumento esgrimido por Ecuador de que las cláusulas solo exigían una negociación debe ser rechazado sobre la base de las conclusiones del Tribunal y la prueba admitida. El Tribunal ya había rechazado la afirmación de Ecuador de que las Cláusulas de Renegociación solo estipulaban la obligación de que las Partes negociasen una compensación mutuamente aceptable[89]. El Tribunal determinó que las cláusulas de absorción "sí establecía[n] el resultado último, es decir, un cambio en las respectivas participaciones de las partes 'que absorba el incremento o disminución de la carga tributaria"[90]. Ecuador confundió el objetivo detrás de las cláusulas (absorción plena) con los medios exactos para alcanzar ese resultado pretendido (negociaciones de buena fe). Las cartas de diciembre de 2006 confirman el entendimiento contemporáneo de Perenco de las cláusulas de absorción, por ejemplo: "el Consorcio presentará las cifras representativas de [dicho] impacto económico en el[los] Contrato[s], a fin de determinar el porcentaje de participación que corresponda ser ajustado a favor de la Contratista"[91].

133. La teoría alternativa de absorción parcial de Ecuador no estaba contemplada en los Contratos. Estos requerían que la corrección absorbiera el incremento o la disminución de la carga tributaria, y no solo un incremento del nuevo impuesto.

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86 Márquez WS II, párrs. 8-9; CE-323, pág. 6.

87 *Véanse* Combe WS II, párrs. 7, 9 y 12-16, y d'Argentré WS V, párrs. 2 y 3.

88 Márquez WS II, párrs. 26-31.

89 Cl. Rep. Q., párr. 152, *que responde a* Resp. C-Mem. Q., párr. 190; *véase también ibid.*, párrs. 161 y 201.

90 Decisión sobre Responsabilidad, párr. 365.

91 Cl. Rep. Q., párr. 156, que cita la Decisión sobre Responsabilidad, párr. 379; también en referencia a Combe WS II, párr. 18.

(b) Posición de Ecuador

134. Ecuador sostuvo que su posición a lo largo de este arbitraje ha consistido en que, dado que nunca se afectó la economía del contrato, la invocación de las cláusulas de modificación de la carga tributaria de los Contratos de Participación no habría llevado a un ajuste de la participación de Perenco, y, por lo tanto, no se debe indemnización alguna[92]. Ecuador sostuvo que la economía de los contratos era una ecuación matemática relativa a la economía subyacente a la Cláusula 8.1 de los Contratos de Participación, que era la ganancia promedio de USD 15 por barril de crudo esperada por el Consorcio o bien la tasa interna de retorno de alrededor del 15% esperada por el Consorcio[93]. El reclamo de Perenco respecto de la absorción plena no encuentra fundamento en los Contratos de Participación (observando a este respecto que el Tribunal había hallado que las Cláusulas de Renegociación "no estipulaba[n] cómo sería calculado el factor de corrección")[94]. Además, la invocación por parte de Perenco de la supuesta práctica histórica de Ecuador relativa a los impuestos IVA y a aquellos relacionados con el SOTE y el ECORAE está definitivamente fuera de lugar.

135. Incluso si el Tribunal considerase necesaria la modificación para que el Consorcio pueda gozar de algún tipo de potencial no especificado 'de alza' en los precios del petróleo, dicha modificación no implicaría solamente la absorción de la diferencia suscitada entre la Ley 42 al 50% y al 99%, sino que solo implicaría la absorción de la cantidad necesaria para proporcionarle al Consorcio la exposición 'al alza' en los precios del petróleo a la que el Tribunal aparentemente consideró que el Consorcio tenía derecho. Tal como explicara The Brattle Group, en el marco de esta teoría, la Ley 42 se aplicaría al Consorcio a una tasa de 81% en el Bloque 21 y de 99% en el Bloque 7, pero, incluso a esas tasas, ninguna modificación de los factores X era necesaria[95].

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92 Resp. PHB Q., párrs. 78 y 79.

93 *Ibid.*,

94 Resp. C-Mem. Q., párr. 141, que cita la Decisión sobre Responsabilidad, párr. 365.

95 Resp. C-Mem. Q., párr. 142.

136. También sostuvo que, dado que el Tribunal determinó que, una vez que se implementó la Ley 42 al 50%, "le correspondía a [Perenco] presentar su caso … en ese momento"[96] y que, como Perenco no lo hizo, ya era muy tarde para que lo haga en la etapa de *quantum* sobre la base de que habría invocado sus derechos "si no se hubiera promulgado" el Decreto 662[97]. Ecuador consideró que Perenco se estaba basando en evidencia ventajista, "que no resultaba creíble *después de* los testimonios" [Traducción del Tribunal], como la declaración del Sr. Márquez de que Perenco simplemente estaba esperando la oportunidad justa para analizar la cuestión de manera apropiada[98]. La verdad era que, independientemente de si creía que el proceso era inútil o no, Perenco había optado por no exigir el cumplimiento de las Cláusulas de Renegociación con respecto a la Ley 42 al 50%[99].

137. Ecuador sostuvo, en consecuencia, que Perenco no podía ahora, en la etapa de *quantum*, pretender invocar las Cláusulas de Renegociación para reclamar la absorción plena de la Ley 42.

(c) La Decisión del Tribunal

138. La cuestión consiste en determinar si la indemnización que debe otorgarse respecto del Decreto 662 debería calcularse (i) por la totalidad del 99% de las ganancias extraordinarias previstas en el Decreto; (ii) por el 49% adicional (a saber, por encima de la Ley 42 al 50%) del valor del precio superior al de referencia que fuera exigido por el Decreto 662; o (iii) sobre la base de algún otro criterio.

139. Al Tribunal le gustaría comenzar recordando que su Decisión sobre Responsabilidad contiene una conclusión que aborda esta cuestión. En el párrafo 703, el Tribunal determinó que:

> "En definitiva, la estrecha cuestión que debe analizar el Tribunal es si Perenco, al recurrir al Tribunal, podría reconfortarse con el hecho de que

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96 Decisión sobre Responsabilidad, párr. 394.

97 Resp. PHB Q., párr. 58. [Traducción del Tribunal]

98 Resp. Rej. Q., párr. 257.

99 Resp. C-Mem. Q., párr. 148.

> su negativa a pagar los montos adeudados correspondientes a 2008 en virtud de la Ley 42 a Ecuador lo protegería en este arbitraje sin consecuencias potencialmente adversas. El Tribunal consideró con detenimiento las posiciones de las Partes. Considera que Perenco tenía derecho a esperar que Ecuador desistiera de ejecutar las coactivas durante el arbitraje. También considera que en su decisión de retener la totalidad de los montos correspondientes a 2008 reclamados en virtud de la Ley 42, Perenco creyó que el Tribunal aceptaría su reclamo de que ningún monto debido en virtud de la Ley 42 y reclamado por el Estado estaba amparado por los Contratos o el Tratado. Debido a que los reclamos de Perenco no se relacionaban con la Ley 42 al 50%, el Tribunal sostiene que aunque Ecuador debería haber cumplido con la Decisión sobre Medidas Provisionales, las coactivas no deberían haberse incluido en el análisis del Tribunal de las medidas que, según se dijo, constituyeron en su conjunto una expropiación indirecta… Además, en la medida en que se admitió el reclamo de Perenco relativo a que el Decreto 662 al 99% era violatorio del Artículo 4 del Tratado, según los párrafos 606-607 anteriores, la ejecución de las coactivas para cobrar el 49% restante reclamado constituyó un incumplimiento de la obligación de conferir un trato justo y equitativo, pero no constituyó una expropiación de la inversión)"[100]. [Énfasis agregado]

140. La redacción exacta de esta conclusión excluye el otorgamiento de una indemnización por los efectos causados por la Ley 42 con anterioridad al primer incumplimiento. Pero el Tribunal también dedujo que la inutilidad fue probada al 4 de octubre de 2007[101]. Más allá de esto, el Tribunal no emitió una decisión respecto de lo que se podría considerar en la etapa de daños con respecto al posible ejercicio de las cláusulas de modificación de impuestos (salvo para señalar cómo se esperaba que operen las disposiciones de los contratos)[102].

141. A efectos de su análisis de daños, el Tribunal considera que debe suponerse que, si Perenco hubiera ejercido sus derechos contractuales en el escenario 'contrafáctico', Ecuador habría respondido de buena fe mediante la negociación de una absorción de la carga tributaria adicional impuesta por el Decreto 662. Luego de haber analizado la prueba, el Tribunal concluye que, si el escenario 'contrafáctico' correspondiente al período posterior al Decreto 662 hubiera tenido lugar, Perenco habría pretendido una compensación. No obstante,

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100 Decisión sobre Responsabilidad, párr. 703.

101 *Ibid.*, párr. 411.

102 *Ibid.*, párrs. 395-398.

considerando la evidencia de manera conjunta, el Tribunal no está convencido de que Perenco habría pretendido la derogación completa de la Ley 42 (es decir, estabilización al 0%). Por el contrario, habría pretendido deshacer el efecto del Decreto 662 y, en la medida de lo razonablemente posible, de la Ley 42.

142. El razonamiento del Tribunal respecto de esta cuestión es inequívoco: (i) era evidente para todos que Ecuador se estaba alejando de los contratos de participación y que se podía esperar que requiriese que cualquier nuevo contrato que pudiera celebrar no siguiera ese modelo; (ii) incluso en el escenario 'contrafáctico', este cambio en la política nacional de explotación hidrocarburífera tendría carácter de hecho lícito; (iii) el Contrato de Participación del Bloque 7 se estaba acercando a su extinción por vencimiento del plazo (en agosto de 2010), situación de la que Perenco tenía pleno conocimiento, además de la necesidad de ajustar sus expectativas en aras de tener alguna oportunidad de obtener una prórroga de sus derechos de operación respecto del Bloque 7; y (iv) ambas Partes están de acuerdo en que el Bloque 7 era el más valioso de los dos Bloques, lo que era perfectamente claro en ese momento.

143. En tales circunstancias, el Tribunal cree que Perenco habría reconocido que los retornos extraordinarios generados en virtud de los Contratos de Participación a razón del incremento sustancial de los precios del petróleo que comenzó a principios de la década del 2000 eran, para Ecuador, prácticamente insostenibles teniendo en cuenta las repercusiones financieras de las ganancias inesperadas que habían sido producidas por los recursos hidrocarburíferos no renovables en el país en virtud de este modelo de contrato. Además, el interés de Perenco en obtener una prórroga contractual para el Bloque 7 habría constituido un fuerte incentivo para que este último moderara sus exigencias de conseguir la absorción plena de la Ley 42. En síntesis, el Tribunal cree que, en el escenario 'contrafáctico', Perenco habría estado más que dispuesto a entablar una negociación en virtud de las cláusulas de modificación del régimen tributario que hubieran reducido la fijación de impuestos a las ganancias extraordinarias por parte del Estado y, además, maximizarían las posibilidades de la empresa de obtener una prórroga de sus derechos de operación respecto del Bloque 7.

144. El Tribunal, por consiguiente, establece que, luego de la entrada en vigor del Decreto 662, Perenco habría promovido las negociaciones de manera inmediata, y las Partes habrían consentido a la aplicación prospectiva de la Ley 42 estabilizada al 33% desde el 5 de octubre de 2008 para ambos contratos.

145. El Tribunal agrega que, si bien cabe la posibilidad de que, en el escenario 'contrafáctico', Perenco aprovechara la oportunidad de las negociaciones de modificación del régimen tributario para negociar simultáneamente una prórroga del Bloque 7, no puede deducirse a ciencia cierta que Ecuador habría consentido al otorgamiento de dicha prórroga. Por consiguiente, la cuestión de la prórroga se aborda separadamente *infra*.

146. El Tribunal resuelve que los derechos de Perenco respecto de los dos Contratos de Participación se habrían ajustado a una tasa en virtud de la Ley 42 estabilizada al 33% desde el 5 de octubre de 2008 hasta el vencimiento del plazo del contrato.

2. Estimación del Impacto Financiero Directo de la Ley 42 al 99%

147. En aras de calcular el impacto financiero directo del Decreto 662, el cálculo del VAN efectuado por Perenco inmediatamente después de la promulgación del Decreto 662 le permitió al Tribunal realizar una estimación aproximada del valor de los derechos de la empresa respecto de los Bloques mediante la sustracción del valor total de los ingresos no percibidos en los años restantes de los Contratos para poder efectuar un cálculo estimativo del valor residual de los derechos de Perenco (lo que se podría denominar valor "inferior al precio de referencia en virtud del Decreto 662"). Esto también fue calculado por The Brattle Group, y los resultados son los siguientes:

Diferencias	**Perenco en 2007**	**Brattle (1er Informe)**[103]	**Brattle (2do Informe)**[104] **– Actualizado con los Costos de RPS**	**Brattle (2do Informe)**[105] **– Actualizado con los Costos del Prof. Kalt**
Valor del Bloque 7 con la Ley 42	VAN: USD 122,1 millones	VJM: USD 109,1 millones	VJM: USD 111,3 millones	VJM: USD 114,5 millones
Valor del Bloque 21 con la Ley 42	VAN: USD 117,3 millones	VJM: USD 156,6 millones[106]	VJM: USD 170,9 millones	VJM: USD 181,3 millones
Valor Total de los Bloques con la Ley 42 *(cf. cálculos de Perenco de 2007)*	**USD 239,4 millones**	**USD 265,7 millones** *(+USD 26,3 millones)*	**USD 282,2 millones** *(+USD 42,8 millones)*	**USD 295,8 millones** *(+USD 56,4 millones)*
Valor del Bloque 7 con el Decreto 662	VAN: USD 84,1 millones	VJM: USD 58,8 millones	VJM: USD 59,1 millones	VJM: USD 58,8 millones
Valor del Bloque 21 con el Decreto 662	VAN: USD 70,5 millones	VJM: USD 48,9 millones[107]***	VJM: USD 68,5 millones	VJM: USD 68,7 millones
Valor Total de los Bloques con el Decreto 662 *(cf. cálculos de Perenco de 2007)*	**USD 154,6 millones**	**USD 107,7 millones** *(-USD 46,9 millones)*	**USD 127,6 millones** *(-USD 27 millones)*	**USD 127,5 millones** *(-USD 27,1 millones)*
Disminución del valor del Bloque 7 debido al Decreto 662	USD 38 millones	USD 50,3 millones	USD 52,2 millones	USD 55,7 millones
Disminución del valor del Bloque 21 debido al Decreto 662	USD 46,8 millones	USD 107,7 millones	USD 102,4 millones	USD 112,6 millones
Pérdida de Valor Total *(cf. cálculos de Perenco de 2007)*	**USD 85 millones**	**USD 158 millones** *(+USD 73 millones)*	**USD 154 millones** *(+USD 69 millones)*	**USD 167 millones** *(+USD 82 millones)*

[Traducción del Tribunal.]

148. En opinión del Tribunal, estas estimaciones proporcionan una verificación útil de la estimación de los daños.

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103 Brattle ER II, nota al pie 157.

104 Tabla M de Brattle.

105 *Id.*

106 Brattle explicó que ellos habían asumido precios y costos más altos que aquellos que estaban incluidos en los modelos de Perenco, como así también un mayor nivel de explotación.

107 Brattle explicó que su modelo asume costos operativos más altos.

149. Para arribar a un monto final calculado de modo *ex ante*, es necesario estimar cuántos pozos habría perforado Perenco en el escenario 'contrafáctico'. En este sentido, los peritos de campos petrolíferos de las partes (el Sr. Crick, en representación de Perenco, quien no actúa en calidad de perito independiente, sino más bien como testigo de hecho con cierta pericia técnica, y RPS, en representación de Ecuador, quienes actúan en calidad de peritos técnicos) sostuvieron opiniones muy diferentes en cuanto a cuál habría sido la actividad de perforación si no se hubiera promulgado el Decreto 662, cuestión que ahora será abordada por el Tribunal.

3. El Impacto del Decreto 662 en los Planes de Perforación de Perenco para los Bloques 7 y 21

150. La prueba demuestra que el decreto causó una interrupción casi inmediata en las operaciones de perforación del Consorcio[108]. En el Anexo BR-26, el correo electrónico de Perenco que contenía los resultados de los cálculos del VAN de la empresa, se refleja cierto debate en cuanto a la continuación del plan de perforación de Oso 23[109]. Pero esta era la única excepción al cese de la actividad de perforación. Los gráficos representativos de los antecedentes de perforación de pozos de la empresa que fueron exhibidos a pedido del Tribunal con posterioridad a la Audiencia sobre *Quantum* demuestran que, si bien Perenco perforó 11 pozos en el Bloque 21 en 2005, 13 en 2006 y uno en 2007, no perforó ninguno en 2008, ni tampoco en la primera mitad de 2009 (tras la que suspendió las operaciones)[110]. En este sentido, Perenco efectuó seis perforaciones en 2005, 11 en 2006 y cinco en 2007

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108 Cl. Mem. Q., párr. 47; d'Argentré WS V, párr. 16; Perrodo WS II, párr. 7.

109 Anexo BR-26: en respuesta a la siguiente pregunta del Sr. Daniel Kadjar: "¿Usted recomienda perforar en Oso-23 y luego entregar la perforadora o entregarla con posterioridad a Oso-22?", el Sr. d'Argentré escribió lo siguiente en un correo electrónico: "Si perforamos el OSO23, debemos explicarle al Estado que esta es la última perforación que haremos y que la llevamos a cabo en virtud de una obligación contractual que tenemos con la contratista encargada de la perforación, y que, obviamente, resulta dificultoso detener una campaña de manera tan repentina. En otras palabras, no queremos que el Estado crea que no detenemos las perforaciones porque estas todavía son rentables para nosotros. Para responder a su pregunta, pienso que deberíamos perforar OSO23 y, mientras tanto, enviarle la notificación de rescisión del contrato a H&P. Tenemos listo todo el equipo de perforación, además de que el VAN todavía ronda los USD 3,7 millones". [Traducción del Tribunal]

110 Gráfico de Perforaciones del Bloque 21 exhibido ante el Tribunal el 15 de diciembre de 2015 mediante un correo electrónico.

en el Bloque 7, pero no efectuó ninguna perforación en 2008, ni tampoco en la primera mitad de 2009[111].

151. El Tribunal no tiene duda alguna de que, si no se hubiera promulgado el Decreto 662 y al no haberse obtenido una prórroga de los Contratos de Participación del Bloque 7, Perenco habría efectuado más perforaciones en el Bloque 7 hasta agosto de 2009 (un año antes del vencimiento del plazo del Contrato, luego de lo cual Perenco habría cesado de perforar pozos a causa de la necesidad de asegurarse una retribución suficiente con anterioridad al vencimiento del plazo del contrato)[112]. En cuanto al Bloque 21 (al que, al momento de la promulgación del Decreto 662, todavía le quedaban 14 años hasta el vencimiento del plazo del Contrato), el Tribunal debe estimar un programa de perforación razonable para ese Bloque, que razonablemente podría esperarse que se extienda con posterioridad a la declaración de caducidad.

152. Este ejercicio también está potencialmente relacionado con la evaluación de las actividades de perforación posteriores a la declaración de caducidad en el sentido de que hay dos períodos que le importan al Tribunal: (i) desde el 4 de octubre de 2007 hasta el 20 de julio de 2010; y (i) desde el 21 de julio de 2010 hasta la fecha de vencimiento del plazo del contrato. Esto implica sopesar los planes reales del Consorcio hasta el 4 de octubre de 2007, fecha en la que fueron suspendidos, y considerar lo que probablemente habría sucedido en ambos bloques, teniendo en cuenta todas las probabilidades, si no se hubiera promulgado el Decreto 662. Este enfoque se adoptará con respecto al primer período. El Tribunal realizará entonces otra estimación para averiguar qué habría sucedido con posterioridad a la declaración de caducidad.

153. Esto necesariamente plantea la cuestión del destino del Contrato del Bloque 7, ya que el Sr. Crick señaló que el Consorcio habría continuado con las perforaciones en el Bloque 7 al menos hasta agosto de 2009. Asimismo, testificó que fue éste el momento en el que, a falta de prórroga, Perenco habría dejado de perforar nuevos pozos a causa de la necesidad

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111 *Id.*

112 Tr. Q. (3) 612:12-21 (Interrogatorio Directo del Sr. Crick).

de gozar de un período retribuciones adecuadas con anterioridad a la devolución del Bloque 7 a Ecuador[113]. En este sentido, el Tribunal considerará, en primer lugar, si, en el escenario 'contrafáctico', Perenco habría gozado de una prórroga de sus derechos de operación en el Bloque 7 con posterioridad a agosto de 2010.

(a) La cuestión de la prórroga del Contrato del Bloque 7 con posterioridad a agosto de 2010

154. Las Partes han desarrollado, y justificadamente, esta cuestión de manera extensa, puesto que da cuenta de una parte significativa del reclamo revisado de Perenco de un total de USD 1.493 millones en concepto de daños. (Véase el "Gráfico de Cascada" de Brattle reproducido en el párrafo 65.) Tal como ya se ha observado, los derechos que le asistían a Perenco en virtud del Contrato del Campo Oso del Bloque 7 eran los más valiosos de los activos ecuatorianos de Perenco[114].

155. Según lo dispuesto en el Contrato, el derecho de Perenco respecto del Bloque 7 vencía el 16 de agosto de 2010, pero, tal como demuestran los sucesos, esto ocurrió unos 27 días después del dictado de la declaración de caducidad[115].

156. El Contrato contenía una cláusula que permitía que fuera prorrogado en ciertas circunstancias:

> "**Cláusula 6.2 Período de Explotación**: El Período de Explotación durará en el presente caso, hasta el 16 de agosto de 2010; este plazo podrá ser prorrogable, siempre y cuando convenga a los intereses del Estado, por las siguientes causas:
>
> - Cuando el área de explotación se encuentre alejada de la infraestructura hidrocarburífera petrolera existente, previa aprobación del Ministerio del Ramo y por un período de hasta cinco (5) años;

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113 Crick WS II, párr. 147: "He asumido que Perenco habría alcanzado un promedio de un pozo por mes y asumo que habría detenido cualquier nueva inversión un año antes de la extinción del contrato [fecha de vencimiento del plazo del Contrato del Bloque 7 de agosto de 2010]". [Traducción del Tribunal]

114 En el mismo sentido, el Presidente de Perenco, François Perrodo, afirmó que la prórroga del Contrato del Bloque 7 era una "cuestión de máxima prioridad" para Perenco y que Perenco estaba dispuesta a ofrecer una suma considerable para obtener dicha prórroga [Traducción del Tribunal]. Perrodo WS II, párr. 10.

115 La caducidad fue declarada el 20 de julio de 2010.

- Cuando la Contratista proponga nuevas inversiones significativas en los últimos cinco (5) años del Período de Explotación, previa aceptación del Ministerio del Ramo y aprobación del CEL, siempre y cuando requieran plazos adecuados de amortización para dichas inversiones;

- Para el caso de eventuales descubrimientos de Yacimientos de Hidrocarburos Comercialmente Explotables provenientes exclusivamente de trabajos de nueva explotación que realizare la Contratista, el plazo de Período de Explotación se prorrogará previa aceptación del Ministerio del Ramo y aprobación del CEL"[116].

(i) Posición de Perenco

157. Perenco sostuvo firmemente que sus derechos contractuales no se habrían extinguido, sino que, en el escenario 'contrafáctico', se le habría permitido operar en el campo de una manera u otra. En este sentido, hizo referencia a evidencia de otras prórrogas que fueron otorgadas por Ecuador a operadores durante el período pertinente[117]. También observó que, incluso durante el período en el que operó en virtud del Decreto 662 al 99%, se encontraba negociando un acuerdo alternativo con Petroecuador –la denominada Acta– y que las partes habían llegado a un acuerdo que finalmente no se concretó porque el otro miembro del consorcio compañero de Perenco, Burlington, tras haber decidido retirarse de Ecuador, rechazó las condiciones propuestas. Tal como determinó el Tribunal, este rechazo proveniente del otro miembro del Consorcio fue esencialmente invocado por Ecuador en contra de Perenco[118].

[1] Ecuador no gozaba de discrecionalidad absoluta con respecto a la decisión del otorgamiento de la prórroga

158. Perenco sostuvo, en primer lugar, que la prueba demostró que un ejercicio de buena fe de la discrecionalidad que le otorga la Cláusula 6.2 a Ecuador seguramente habría derivado

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116 CE-17.

117 Cl. Rep. Q., párr. 168, que se basa en Resp. C-Mem. Q, párr. 118, que cita los contratos modificados para los Bloques 10, 14, 16, 17, MDC, PBHI y Tarapoa.

118 Decisión sobre Responsabilidad, párr. 619.

en el otorgamiento de una prórroga de los derechos de operación de Perenco en el Bloque 7. Ecuador no gozaba de discrecionalidad absoluta para negarse a otorgar una prórroga de los derechos de operación de Perenco en el Bloque 7. Tal como señaló el Dr. Pérez Loose en su interrogatorio, una lectura apropiada de la Cláusula 6.2 consistiría en que, en caso de haberse suscitado cualquiera de las tres causas requeridas para la prórroga[119], el interés superior del Estado quedaba presuntamente satisfecho, y Ecuador estaba obligado a otorgar la prórroga[120].

[2] Las Partes podrían haber acordado una prórroga sobre la base de nuevas estipulaciones

159. Perenco, asimismo, objetó la interpretación de la Cláusula 6.2 por parte de Ecuador que consistía en que esta cláusula solo le permitía otorgar una prórroga con respecto a la fecha de vencimiento del plazo del Contrato del Bloque 7, con exclusión de cualquier modificación del resto de las estipulaciones del contrato, por considerar que carece de sustento en el lenguaje del contrato y es poco realista. De hecho, fue desacreditada por la propia práctica consistente de Ecuador de prorrogar los derechos de operación de las contratistas existentes sobre la base de cláusulas contractuales modificadas[121].

160. Ecuador no había objetado el hecho de que estaba preparado para conceder la prórroga de los derechos de operación de Perenco en el Bloque 7 en virtud de cláusulas distintas de las existentes, y tampoco que así lo habría hecho de haber cumplido con sus obligaciones internacionales y contractuales. Los testigos de Ecuador, entre ellos, los Sres. Dávalos, Palacios, Pinto y Chiriboga, reconocieron en varias ocasiones durante la etapa de fondo, su

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119 Loose ER VI, párr. 38: "La Cláusula 6.2 establecía el derecho de Perenco de ver el plazo del contrato extendido si se cumplían ciertas condiciones: (i) cuando 'el área de explotación se encuentre alejada de la infraestructura hidrocarburífera petrolera existente...'; (ii) cuando la Contratista proponga 'nuevas inversiones significativas en los últimos cinco (5) [años] del Período de Explotación...' y 'siempre y cuando requieran plazos adecuados de amortización para dichas inversiones'; y (iii) cuando hay '...descubrimientos de Yacimientos de Hidrocarburos Comercialmente Explotables provenientes exclusivamente de trabajos de nueva explotación que realizare la Contratista...'".

120 Cl. PHB Q., párr. 66. Tr. Q. (4) 907:14-908:3 (Pérez Loose); *véanse también* Tr. Q. (3) 872:10-19 (Pérez Loose), Tr. Q. (4) 901:20-902:7 (Pérez Loose); Loose ER VII, párr. 52.

121 Resp. C-Mem. Q, párr. 118, que cita los contratos modificados para los Bloques 10, 14, 16, 17, MDC, PBHI y Tarapoa, pero aclara que los plazos de estos contratos no fueron prorrogados.

deseo de que Perenco continuase operando en el Bloque 7[122]. En cuanto a los testigos de Perenco, ellos confirmaron que la prórroga era una cuestión de máxima prioridad para la empresa y que creían que podrían haber llegado a un acuerdo con Ecuador si no hubiera sido por los actos ilícitos. Esto último fue corroborado por documentación y correspondencia internas y contemporáneas de Ecuador y no fue puesto en tela de juicio en el contrainterrogatorio[123].

161. El interés mutuo de las Partes en prorrogar las operaciones de Perenco en el Bloque 7 era consistente con la prolongada práctica histórica en la industria de exploración y explotación petrolera a modo general, y, particularmente, en Ecuador, que consiste en prorrogar los contratos de los operadores actuales. Según el testimonio prestado por el Sr. Dávalos en su segundo interrogatorio directo, Ecuador, aparentemente, se negó a prorrogar el plazo de los contratos solo dos veces en las últimas tres décadas[124].

162. Solo en el año 2010, Ecuador suscribió siete contratos de petróleo modificados, mediante los que renovó los plazos de seis de los contratos originales por períodos de entre seis y quince años[125].

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122 *Véase* Palacios WS I, párr. 22; Palacio WS II, párrs. 25 y 33: Pinto WS I, párrs. 22 y 23; Pinto WS II, párrs. 9, 17 y 18; Chiriboga WS I, párrs. 12 y 13; Tr. M. (4) 953:15-954:9 (Chiriboga). Los abogados de Perenco también sostuvieron que: "Ecuador siempre fue un muy socio razonable. En su carta de 1° de marzo de 2006 el presidente Palacios indicó lo siguiente: 'en reiteradas ocasiones he invitado a las petroleras que tienen contratos con el Estado a iniciar procesos para llegar a un entendimiento para la distribución equitativa de las ganancias extraordinarias. Sin embargo, esta invitación no ha recibido respuesta, una situación que justifica una vez más las reformas propuestas, sin que esto signifique que la renegociación ha quedado cerrada'. Al mismo tiempo que el presidente Palacios presentó este borrador de lo que sería después la Ley 42, expresamente estaba diciendo que la negociación sería posible y que esperaba que se pudiera seguir adelante y trabajar con las petroleras y discutir los contratos petroleros.

[…]

Después de ver los hechos claves de la Ley 42 y la velocidad de los contratos de participación a través de la caducidad, Ecuador siempre fue un socio razonable. Ustedes vieron que en las invitaciones a negociar en 2005 eso quedó claro. También vieron esto en la carta del presidente Palacios el 1° de marzo de 2006, y en consecuencia Ecuador siempre estuvo dispuesto a negociar. Pero pasemos directamente a los hechos…" (Tr. M. (1) 284:22-285:16; 290:8-17)

123 Cl. PHB Q., párr. 117, en referencia a CE-323, pág. 6; Anexo BR-32, Diapositiva 36; E-387, Diapositiva 103; CE-324.

124 Tr. Q. (3) 757:11-758:14, 797:8-798:17 (Dávalos).

125 *Véase* http://www.hidrocarburos.gob.ec/biblioteca/ (sitio web del Ministerio de Hidrocarburos, que contiene enlaces a los contratos modificados para los Bloques 10, 14, 16, 17, MDC, PBHI y Tarapoa). Cl. Mem. Q., párr. 146.

163. Finalmente, Perenco estuvo dispuesta a celebrar un contrato de prestación de servicios razonable para el período de prórroga. Perenco sostuvo que Ecuador no negó que sería razonable asumir que los plazos de prórroga se encontrarían en algún punto entre las posiciones originales de negociación de las partes, pero que se encontrarían más aproximados a la posición inicial de Ecuador que a la de Perenco, para la que la Ley 42 al 37,5% resulta razonable como parámetro. La prórroga del contrato de prestación de servicios de Eni (AGIP) constituye un fundamento irrefutable para esta conclusión. Se trataba de un contrato de servicios en un bloque vecino para el que Ecuador aceptó una prórroga de once años. Perenco consideró, específicamente, un contrato como el de AGIP como parte de su estrategia de prórroga contemporánea. Por lo tanto, ese contrato es un buen punto de referencia para las condiciones que Ecuador habría aceptado para el otorgamiento de una prórroga. Perenco observó que los informes de Brattle no contenían opinión alguna respecto de ningún supuesto de prórroga.

[3] El otorgamiento de la prórroga habría sido conveniente para el interés superior de Ecuador

164. En cuanto al argumento de Ecuador de que el Estado habría actuado de manera negligente si otorgaba la prórroga de los derechos de operación de Perenco en el Bloque 7 puesto que la propuesta económica no era atractiva, Perenco sostuvo que dicha afirmación de parte de Ecuador fue efectuada sobre la base de un análisis económico defectuoso. En la opinión de Perenco, el análisis del Profesor Dow calculó el valor de una prórroga del Bloque 7 solo hasta la aceleración de la inversión y la explotación, pero omitió evaluar los beneficios que conlleva la asociación con contratistas privadas con experiencia. En cualquier caso, el Profesor Dow también infravaloró el beneficio que produciría dicha aceleración.

165. En la Audiencia sobre *Quantum*, el Profesor Dow admitió que una prórroga del plazo del contrato habría producido beneficios para Ecuador superiores al monto pagado a Perenco y, por ende, sería conveniente para el interés superior de Ecuador[126]. El Profesor Dow

[126] Tr. Q. (5) 1396:19-1397:9, 1486:20-1487:7 (Dow); Tr. Q. (5) 1487:8-19 (Dow). Tr. Q. (5) 1487:15-19 (Dow); *véase también* Brattle ER III, párr. 172.

admitió que los gastos de capital de Ecuador correspondientes al período comprendido entre los años 2008 y 2010 eran susceptibles de ser mucho mayores que los gastos de capital del 12% de Perenco y que, en sus cálculos del valor de la prórroga, omitió el elevado costo de oportunidad derivado del hecho de que Ecuador tuviera que invertir su propio capital en la industria petrolífera en lugar del sector público[127].

166. Además, Ecuador no aportó evidencia alguna para fundamentar sus reclamos de que la política de migrar a contratos de prestación de servicios y las supuestas prácticas ambientales insatisfactorias de Perenco derivaran en que el otorgamiento de una prórroga de los derechos operativos de Perenco no fuera conveniente para los intereses de Ecuador[128].

[4] Perenco había cumplido las condiciones impuestas para el otorgamiento de la prórroga en virtud de la Cláusula 6.2

167. Perenco sostuvo, además, que había cumplido dos de las condiciones para el otorgamiento de la prórroga en virtud de la Cláusula 6.2.

168. En primer lugar, el descubrimiento de petróleo en el reservorio Hollín del campo Oso cumplía el requisito de descubrimiento de nuevos "Yacimientos de Hidrocarburos Comercialmente Explotables". Estos eran "aquellos yacimientos de Crudo que, en opinión de la Contratista, fueran yacimientos comerciales y estuvieren incluidos en un Plan de Desarrollo aprobado o en un Plan de Desarrollo Adicional". [Traducción del Tribunal]. Perenco no necesitaba descubrir nuevos campos. El hecho de que Perenco no hubiera planteado su descubrimiento del yacimiento en Oso Hollín como posible fundamento para la prórroga en la Reunión del Comité de Presupuesto de septiembre de 2007 ("**BCM**, por sus siglas en inglés") carecía de relevancia.

169. En segundo lugar, propuso nuevas inversiones significativas durante los últimos cinco años de vigencia del Contrato. Perenco había propuesto perforar hasta 16 pozos adicionales en

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127 Tr. Q. (5) 1494:1-11 (Dow); Tr. Q. (5) 1401:5-7 (Dow); *cf.* Tr. Q. (5) 1248:5-15 (Kalt).

128 Cl. PHB Q., párr. 120.

su Plan de Desarrollo de Oso del año 2006, y sus resultados positivos habrían producido una inversión adicional importante, lo que, a su vez, habría justificado el otorgamiento de una prórroga del plazo del Contrato. En septiembre de 2007, Perenco también planeó proponer proyectos adicionales a cambio de la prórroga del Bloque 7. Incluso durante las negociaciones del año 2008, Perenco aceptó una inversión mínima de USD 110 millones en el Bloque 7.

[5] Perenco habría perforado 70 pozos nuevos en el caso de que se le hubiera otorgado una prórroga hasta el año 2018

170. Suponiendo que se hubiera otorgado la prórroga del Bloque 7, aunque en virtud de cláusulas diferentes, el plan de perforación correspondiente al Bloque 7 del escenario 'contrafáctico' del Sr. Crick se enfocó principalmente en el Campo Oso. Perenco observa que no solo propuso precisamente los 70 pozos que se incluyeron en el programa del Sr. Crick en su Revisión Interna del año 2008, sino que Petroamazonas ha perforado al presente unos 105 pozos nuevos en el campo Oso y, sobre la base de su Plan de Desarrollo de Oso de abril de 2014, planea perforar 28 más[129]. Petroamazonas está en camino a perforar casi el doble de pozos que aquellos planeados por el Sr. Crick[130]. Esto fue confirmado durante la Audiencia sobre *Quantum* por el Sr. d'Argentré[131] y el Sr. Crick[132].

171. El análisis del Sr. Crick fue revisado por el Dr. Strickland, perito independiente de la Demandante en este procedimiento. Su C.V. contiene 37 años de experiencia en la ejecución y supervisión de proyectos de ingeniería y geológicos en reservorios, con inclusión de estudios de campo, valuaciones económicas, auditorías y aprovechamiento de campos[133].

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129 Cl. Rep. Q., párr. 89.

130 *Véase* Gráfico de Perforaciones del Bloque 7, exhibido ante el Tribunal el 15 de diciembre de 2015.

131 Tr. Q. (2) 504:17-505:1, Tr. Q. (3) 609:7-11

132 Tr. Q. (3) 612:8-613:1.

133 Strickland ER I, párrs. 5-8.

172. El Dr. Strickland revisó el plan del Sr. Crick y observó que estos números estaban basados en un plan de desarrollo que Perenco creó a fines del año 2008 y que parecían razonables a la luz del desarrollo de magnitud mucho mayor del campo que desde entonces había asumido Petroamazonas[134]. Desde el año 2009, Petroamazonas había perforado 142 pozos en el Bloque 7, 105 de los cuales fueron perforados en Oso[135].

173. Perenco sostuvo que estos desarrollos se llevarían a cabo durante un período de prórroga de los derechos operativos de Perenco en el Bloque 7 que se extendería hasta 2018. La información más reciente aportada por Ecuador en junio de 2015 indica que Petroamazonas dentro de poco estaría concentrando su atención en los mismos reservorios que el Sr. Crick ha programado para recuperación secundaria por inyección de agua[136].

174. Los números más recientes y revisados del Sr. Crick para los volúmenes de explotación del Bloque 7 son los siguientes[137]:

BLOQUE 7				
		Plazo original		**Con prórroga**
En los pozos existentes	desde el 01/08/2009 hasta el 16/08/2010		desde el 01/08/2009 hasta el 16/08/2018	
	Coca Payamino	1.605.545		9.693.365
	Resto del Bloque 7	2.651.148		13.818.821
Ganancia neta de los pozos nuevos				
	desde el 01/12/2007 hasta el 16/08/10			
	Coca Payamino		desde el 01/12/2007 hasta el 16/08/2018	
	Resto del Bloque 7	**13.473.339**	Coca Payamino	20.448.190
			Resto del Bloque 7	78.533.142
Totales del Bloque 7		**17.730.032**		**122.493.518**

134 Referencia 6 del Anexo Strickland, Informe de Ryder Scott de fecha 30 de junio de 2013; Referencia 11 del Anexo de Strickland, ECPROD29062, Profundidad Total Pozos.xlsx.

135 Crick WS II, Apéndice U.

136 Cl. Rep. Q., párr. 91.

137 Crick WS III, Figura 1, Proyección revisada para los Bloques 7 y 21. [Traducción del Tribunal]

[6] Condiciones y valor de la prórroga

175. Perenco sostuvo que, dada la prueba esencialmente no refutada de que Ecuador y Perenco habrían acordado una prórroga para el Bloque 7, la única cuestión pendiente era la de las condiciones económicas en las que se habría otorgado dicha prórroga. Puesto que las condiciones del acta del año 2008 fueron el producto de lo que el Tribunal ya había establecido como coerción[138], las condiciones acordadas sin dicha coerción naturalmente habrían sido más favorables para Perenco[139].

176. Según Perenco, durante la Audiencia sobre *Quantum* se demostró la razonabilidad del enfoque del Profesor Kalt para estimar el valor de la prórroga. Ecuador no negó que sería razonable asumir que las condiciones de la prórroga se habrían encontrado en algún punto entre las posiciones iniciales de negociación de las partes, pero que se encontrarían más aproximadas a la posición inicial de Ecuador que a la de Perenco, para la que la Ley 42 al 37,5% resulta razonable como parámetro[140].

177. El enfoque de Perenco con respecto a la determinación del valor de la prórroga del plazo del contrato es, por lo tanto, un parámetro razonable para el valor que se habría producido en virtud de una negociación justa entre las partes si Ecuador no hubiera actuado ilícitamente. Perenco incluso ha asumido que Ecuador habría actuado de mejor manera en las negociaciones y ajustado el punto de encuentro de compraventa al cuartil más bajo del diferencial existente entre el mejor escenario de Perenco (sin Ley 42) y el mejor escenario de Ecuador (Ley 42 al 50%)[141].

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138 Decisión sobre Responsabilidad, párrs. 606, 609, 612 y 686.

139 Tr. Q. (1) 150:14-151:1 (Alegato de Apertura de la Demandante); véanse también Cl. Mem. Q., párrs. 151, 152 y 177; JK ER III, párrs. 133 y 134.

140 *Véanse* Tr. Q. (1) 147:14-148:16 (Alegato de Apertura de la Demandante); Tr. Q. (5) 1301:22-1302:4 (Kalt); véanse también Cl. Mem. Q., párrs. 148-154 y 173-176; Cl. Rep. Q., párr. 179; d'Argentré WS V, párrs. 24-27; Márquez WS II, párr. 39; JK ER III, párrs. 130-132.

141 Kalt ER III, párrs. 130-132.

178. Según Perenco, la prórroga del contrato de prestación de servicios de AGIP[142] proporciona un fuerte respaldo para esta conclusión[143]. Se trataba de un contrato de prestación de servicios (por ende, consistente con la instrucción política aducida por Ecuador) en un bloque vecino en el que Ecuador aceptó una prórroga de 11 años, y, por lo tanto, era alrededor de un 40% más extensa que el período de la prórroga que Perenco reclama en este arbitraje. Perenco consideró específicamente un contrato de tipo AGIP como parte de su "estrategia de prórroga" contemporánea[144]. Por lo tanto, el contrato es un buen punto de referencia para las condiciones que Ecuador habría aceptado para la prórroga. El resultado es comparable tanto si se utiliza para corroborar el enfoque del Profesor Kalt[145] como en calidad de enfoque sustituto.

179. Sobre la base del análisis del Profesor Kalt, Perenco sostuvo que el *quantum* de la indemnización de daños que debe pagarse a Perenco respecto de la prórroga del Bloque 7 se encuentra entre USD 600 y 625 millones (USD 626 millones sobre la base de la Ley 42 al 37,5% o USD 604 millones sobre la base del contrato AGIP, utilizado como un parámetro que Perenco y Ecuador habrían acordado en el escenario 'contrafáctico')[146].

(ii) Posición de Ecuador

180. Ecuador alegó que la operación del Bloque 7 no se habría prorrogado por sendos motivos, entre los que se incluyen los siguientes: (i) Ecuador gozaba de discrecionalidad para otorgar o no una prórroga, pero no para otorgarla en otras condiciones; (ii) el otorgamiento de la prórroga no habría convenido a los intereses del Estado ; y (iii) Perenco no habría cumplido con los requisitos para acceder al ejercicio de discreción conforme a la Cláusula 6.2 del Contrato. La cuestión que el Tribunal debió decidir consistía en sí, de algún modo, el Contrato de Participación debía prorrogarse, no en si se habría renegociado como un

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142 CE-328.

143 *Cf.* Tr. Q. (1) 149:13-21 (Alegato de Apertura de la Demandante); Cl. Mem. Q., párr. 153.

144 Véanse, por ejemplo, E-387, Diapositivas 105 y 107; BR-32, Diapositivas 36 y 37; véase también Tr. Q. (1) 149:13-21 (Alegato de Apertura de la Demandante), Cl. Mem. Q., párr. 153.

145 Cl. PHB Q., párr. 130, en referencia a Tr. Q. (5) 1388:8-12 (Kalt) y JK ER IV, párrs. 5, 9, 125 y 126; JK-64.

146 Anexo JK-64.

contrato de prestación de servicios como el de AGIP. Además, los hechos demostraron que la renegociación fracasó debido, entre otros motivos, a la decisión de Burlington de retirarse de Ecuador en lugar de participar de una renegociación[147].

[1] Ecuador gozaba de amplia discrecionalidad para otorgar o no una prórroga del Contrato de Participación del Bloque 7

181. Ecuador alegó que la Audiencia sobre *Quantum* demostró que la Cláusula 6.2 del Contrato de Participación del Bloque 7 comprendía dos niveles de discreción —el Estado: (i) "*podrá*" prorrogar el contrato existente; y (ii) "*siempre y cuando convenga a los intereses del Estado*". Dicha discreción únicamente se activaba si se cumplía con, al menos, uno de los tres requisitos técnicos establecidos en la Cláusula 6.2.

182. En cuanto al primer nivel de discreción, la redacción de la Cláusula 6.2 del Contrato era clara ("…*este plazo podrá ser prorrogable, siempre y cuando convenga a los intereses del Estado, por las siguientes causas*…" [Énfasis agregado]). Esto otorgaba a Ecuador un amplio margen de discrecionalidad para decidir si prorrogaría o no el Período de Explotación del Contrato en cuestión. Según la opinión de Ecuador, el Dr. Pérez Loose no pudo eludir el lenguaje de la Cláusula 6.2[148] y el Sr. Perrodo francamente había reconocido la facultad discrecional de Ecuador de otorgar o no una prórroga[149].

183. Ecuador criticó la interpretación que propuso Perenco por no respetar la intención expresa de las partes[150]; no cumplía con la Cláusula 6.2 en general[151], tal como reconociera el Dr. Pérez Loose en el contrainterrogatorio[152]; y la palabra "*shall*" [deberá] en el inciso 6.2.3 no podía anular la palabra "*may*" [podrá] en el párrafo introductorio de la Cláusula 6.2, que

147 Resp. Rep. PHB Q., párr. 20.
148 Tr. Q. (4) 894:12-895:1 (Pérez Loose).
149 Tr. Q. (2) 547:3-548:2 (Perrodo).
150 Resp. PHB Q., párr. 30.
151 *Ibid.*,párr. 31.
152 Tr. Q. (4) 900:21-903:15 (Pérez Loose).

controlaba toda la disposición. El inciso 6.2.3 se refería al acto de obtener el acuerdo previo del Ministerio de Energía y Minas, y la aprobación del Comité Especial de Licitaciones.

184. Perenco tampoco logró demostrar una supuesta práctica en Ecuador de prorrogar todos los contratos relativos al petróleo porque esa práctica era inexistente. Tal como declarara el Dr. Dávalos, hubo dos instancias (Texaco y Sinopec) en las que Ecuador no otorgó una prórroga porque no convenía a sus intereses[153]. Aunque existiese dicha práctica, ello no podría anular legalmente la facultad discrecional de la que gozaba Ecuador en virtud de la Cláusula 6.2.

185. Por último, Perenco no podía invocar el principio de buena fe del derecho ecuatoriano para transformar la palabra "*may*" en "*shall*".

[2] Una prórroga del Contrato de Participación del Bloque 7 no habría convenido a los intereses del Estado

186. La Cláusula 6.2 establecía un segundo nivel de discrecionalidad para el Estado, dado que el Período de Explotación solo se puede prorrogar "*siempre y cuando convenga a los intereses del Estado*". Según explicara el Dr. Aguilar, al determinar el interés público, el Estado debe primero verificar que el hecho haya ocurrido. Si ocurrió, el siguiente paso era decidir si correspondía o no prorrogar el Contrato[154]. La prórroga del Contrato de Participación no habría beneficiado a Ecuador por los siguientes motivos.

187. En primer lugar, Ecuador había decidido, en aquel entonces, adoptar una política de migración de los contratos de participación a contratos de prestación de servicios. Contrariamente a la afirmación de Perenco, los testigos de Ecuador habían declarado acerca de la renegociación infructuosa de los Contratos de Participación y no de la eventual prórroga del Contrato de Participación del Bloque 7[155]. Aun si Perenco alegara que habría aceptado un modelo distinto para la prórroga de su gestión del Bloque 7, Perenco solo había

153 Tr. Q. (3) 757:16-758:14 y Tr. Q. (3) 797:3-798:17 (Dávalos).

154 Tr. Q. (4) 962:19-21 (Aguilar).

155 Resp. Rep. PHB Q., párr. 21.

calculado el valor de la prórroga del Bloque 7 con arreglo a la Ley 42 en 37,5%; se supone que eso significa que se trató de una prórroga en virtud de un contrato de participación (ya que la Ley 42 solo regía dichos contratos) y, por lo tanto, el cambio que realizó Perenco a último momento con respecto a su base de valuación para emplear los servicios de AGIP debe desestimarse de inmediato.

188. En segundo lugar, habría sido antieconómico para Ecuador. Ecuador se rigió no solo por el beneficio económico, sino por una gran cantidad de objetivos. El perito de Perenco, Dr. Pérez Loose, se vio obligado a retractarse de su declaración de que los intereses del Estado se redujeron a obtener la mayor cantidad posible de petróleo, ya que finalmente admitió que abarcaron otras cuestiones, como la salud, el medio ambiente, la defensa, *etc.*[156]. Perenco no pudo fundarse en pruebas *ex post facto* de sus propios testigos en relación con los supuestos beneficios de una prórroga, y que fue una gran prioridad para Perenco, para alegar que las Partes no habrían acordado la prórroga[157].

189. En tercer lugar, Perenco no fue muy respetuoso con el medio ambiente, y probablemente sea responsable de la contaminación causada en los Bloques.

[3] Perenco no cumplió con los requisitos técnicos de la Cláusula 6.2

190. Perenco sugirió que Ecuador no refutó en la Audiencia sobre *Quantum* el hecho de que se hubieran cumplido dos requisitos técnicos de la Cláusula 6.2 invocados por Perenco. Por un lado, la carga de la prueba le corresponde a Perenco. Por otro lado, y tal como demostrara Ecuador en su Escrito Posterior a la Audiencia[158], Perenco no demostró haber cumplido ni uno de los requisitos técnicos establecidos en la Cláusula 6.2.

191. En este sentido, Perenco no demostró que había descubierto nuevos Depósitos de Hidrocarburos Explotables desde el punto de vista Comercial como resultado exclusivo de

156 Tr. Q. (4) 910:17-911:17 y Tr. Q. (3) 874:3-8 (Pérez Loose).

157 Resp. Rep. PHB Q., párr. 22.

158 Resp. PHB Q., Sección 3.1.3.

nuevas tareas de exploración conforme a la Cláusula 6.2.3. Las pruebas aportadas en la Audiencia sobre *Quantum* confirmaron que Perenco se benefició de datos de registro existentes que demostraban la presencia de petróleo en Hollín. El Sr. Combe también confirmó que BP, predecesora de Perenco en el Bloque, había llevado a cabo las primeras actividades de exploración en Oso en la década de los 80[159]. La presencia de petróleo fue confirmada en 1988[160] y Perenco se encontraba en poder de esta información antes de perforar Oso 3[161].

192. Por ende, Perenco no había incluido este supuesto descubrimiento al perforar el pozo de Oso 3 en el reservorio Hollín como parte de su estrategia para prórroga en la Reunión del Comité de Presupuesto de septiembre de 2007. Tampoco asignó un valor a una prórroga al calcular el VAN de su inversión en el año 2007.

193. Perenco no propuso nuevas inversiones importantes antes del vencimiento del plazo del Contrato de Participación con el fin de poder acceder a una prórroga. La Audiencia sobre *Quantum* confirmó que Perenco sabía muy bien que una prórroga del Período de Explotación era incierta. Así, a partir del año 2007, Perenco actuó en consecuencia y aceleró las inversiones y el desarrollo de proyectos para garantizar la recuperación de la inversión dentro del plazo contractual:

> "P: Entonces, señor Perrodo, ¿es justo decir que entre 2007, ante la falta de una prórroga contractual, Perenco solamente realizaría inversiones en el Bloque 7 que podrían ser amortizadas o reembolsadas después de agosto de 2010?
>
> R: […] mi decisión fue ganar tanto dinero como fuese posible en caso de que no se nos concediera una extensión, que claramente no es lo que queríamos. Pero ese es el motivo por el cual decidimos acelerar el desarrollo"[162].

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159 Tr. Q. (2) 348:3-16 (Combe).

160 Tr. Q. (2) 350:9-11 (Combe).

161 Tr. Q. (2) 351:15-352:6 (Combe).

162 Tr. Q. (2) 546:9-547:2 (Perrodo). *Véase también* Perrodo WS II, párrs. 6-7.

[4] Aun en un escenario de prórroga hipotética, el programa de perforación del Sr. Crick no habría ocurrido

194. Ecuador critica, asimismo, el escenario de prórroga del Bloque 7, con el proyecto de anegación de 127 pozos[163] que defiende el Sr. Crick, por considerarlo un "intento cínico por parte de Perenco de inflar excesivamente el monto de su reclamo"[164]. El Sr. Crick había basado su previsión en una metodología defectuosa. Este defecto es más evidente a partir de la importante discrepancia entre la producción prevista del Sr. Crick y la producción real del yacimiento de Oso.

195. Los únicos 2 proyectos de un solo pozo desarrollados en los yacimientos Lobo y Coca-Payamino no pudieron establecer la continuidad de la formación rocosa Napo U, la piedra angular para un proyecto de anegación exitoso. Al confrontarlo con el hecho de que el pozo piloto en Lobo no tuvo el mismo impacto en dos pozos equidistantes, el Sr. Crick admitió que esto se pudo deber a la discontinuidad de la formación rocosa en este yacimiento[165]. El Dr. Strickland también se vio obligado a admitir que los resultados del estudio limitado que se llevó a cabo (es decir, un pozo inyector en cada uno de los yacimientos Lobo y Payamino) demuestran heterogeneidad (o discontinuidad) en el reservorio Napo analizado[166].

196. El posterior intento de Perenco de argumentar que el patrón de desarrollo de "5 puntos" del Sr. Crick minimizaría los riesgos del desarrollo y explicaría las discontinuidades no hizo más que reforzar los resultados inciertos obtenidos por el Consorcio. Perenco también se equivocó al intentar defender el proyecto de anegación de 127 pozos del Sr. Crick mediante documentos que reflejaban las inversiones riesgosas que propuso el Consorcio durante las negociaciones para la prórroga del contrato[167]. De hecho, Ecuador alegó que estos

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163 Tr. Q. (3) 609:9-11 (Presentación directa de Crick): "Si se hubiese logrado una prórroga, habríamos perforado 70 pozos más a 120 más adicionales para la parte de anegación".

164 Resp. Rep. PHB Q., párr. 76. [Traducción del Tribunal]

165 Tr. Q. (3) 692:11-16 (Crick).

166 Tr. Q. (4) 1027:14-15 (Strickland).

167 Cl. PHB Q., párr. 30.

documentos: (i) demostraban que el Consorcio solo contemplaba un máximo de 29 pozos inyectores de agua en un escenario de prórroga, y (ii) ni siquiera mencionaban un patrón de desarrollo de '5 puntos'[168].

197. Ecuador alegó que Perenco persistió con el proyecto de anegación de 37 pozos del Sr. Crick en el reservorio Basal Tena en Coca-Payamino, sin siquiera llevar a cabo una prueba piloto en este reservorio y a pesar de que el Sr. d'Argentré admitió que, para que un proyecto de anegación funcione, primero se debe probar el concepto en el reservorio[169]. Incluso el Dr. Strickland tuvo que reconocer que "[e]n Basal Tena […] las reservas de la reinyección de agua eran más inciertas porque no hubo un piloto que estableciese ningún tipo de información respecto de Basal Tena", lo que generó "más incertidumbre"[170] y socavó el proyecto de anegación del Sr. Crick.

198. Asimismo, la información *ex post*, en la que Perenco se basó mucho, no respaldaba la anegación como estrategia de desarrollo viable en el Bloque 7. De hecho, Ryder Scott — empresa especializada en proyectos de anegación[171]— nunca mencionó Petroamazonas en sus informes.

199. Por último, Perenco no tuvo razón al alegar que el Sr. Combe y el Sr. d'Argentré defendieron el proyecto de anegación del Sr. Crick. El Sr. Combe ni siquiera habló de anegación[172]. El Sr. d'Argentré sí lo hizo, pero difícilmente podría considerarse que su testimonio respalda el amplio proyecto de anegación del Sr. Crick, ya que admitió que: (i) no sabía cuántos pozos el Sr. Crick proponía perforar como parte de este proyecto; y (ii) no creía que el Sr. Crick estuviese proponiendo mucho desarrollo en estos yacimientos, puesto que ya se encontraban desarrollados[173]. Perenco no mencionó ninguna prueba de que los socios del Consorcio considerasen llevar a cabo un proyecto de anegación tan

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168 Crick WS II, Apéndice L, Diapositivas 114-119.

169 Resp. PHB Q., párr. 112, que cita Tr. Q. (2) 482:22-483:6 (d'Argentré).

170 Tr. Q. (4) 1058:22-1059:5 (Strickland).

171 CE-333, pág. 2.

172 Resp. Rep. PHB Q., párr. 76.

173 Tr. Q. (2) 482:2-8 (d'Argentré).

grande y costoso como el del Sr. Crick en la zona norte del Bloque. El Sr. Combe admitió que el Consorcio "[decidió] instalar un campamento cerca de Oso porque ahí [iba] a tener todo el trabajo por realizar"[174].

[5] Condiciones y valor de la prórroga

200. Ecuador alegó que los peritos de ambas partes confirmaron en la Audiencia la irracionalidad del valor extraordinariamente alto de la prórroga de Perenco (que representaba más del 40% de los daños alegados por Perenco). El análisis de FFD no debería incluir una prórroga hipotética, menos aun cuando las suposiciones contemporáneas de Perenco no asignaron ningún valor a una eventual prórroga.

201. Al calcular el supuesto valor de una prórroga hipotética, el Profesor Kalt no aplicó las cláusulas de las Actas de Acuerdo Parcial de 2008. Por el contrario, Perenco presentó sus propias cláusulas para un nuevo contrato[175]. El Profesor Kalt no calculó el valor de un contrato de prestación de servicios renegociado (a la luz de la política de Ecuador de migrar a un contrato de prestación de servicios) y, en consecuencia, Perenco no cumplió con su carga de la prueba.

202. En cuanto al aspecto económico de la prórroga, la cuestión no fue si la prórroga pudo haber aportado beneficios a Ecuador, sino qué precio habría estado dispuesto Ecuador a pagar por esos beneficios. Las cláusulas de Perenco suponían que Ecuador habría acordado pagar más que los beneficios económicos que pudiera haber esperado de una prórroga. Brattle demostró ampliamente que no habría tenido sentido económico para Ecuador acceder a una prórroga basada en las cláusulas de Perenco porque estas otorgaban "más del 100 por ciento de participación [del valor generado por la prórroga] para la Contratista"[176].

203. Ecuador planteó el tema de la siguiente manera: Ecuador aceptó pagar a Perenco, además de la rentabilidad rentabilidad estándar, una suma adicional de USD 626 millones para que

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174 Tr. Q. (2) 330:18-20 (Combe).

175 Kalt ER IV, párr. 126 – daños adeudados a Perenco suponiendo que las cláusulas de prórroga contenidas en las Actas de Acuerdo Parcial de 2008 ascenderían a USD 1,144 millones a julio de 2015.

176 Tr. Q. (5) 1401:14-1402:13 (Dow); Brattle ER II, párrs. 141-176; Brattle ER III, párrs. 137-155.

Perenco siguiera operando el Bloque 7 hasta 2018, cuando Ecuador recibiera los yacimientos sin costo alguno en agosto de 2010 (es decir, al vencer el contrato) y cualquier contratista asumiera el mando de las operaciones en ese entonces —solo si Perenco ofrecía a Ecuador beneficios que no hubiera podido ofrecer ningún otro contratista. El único beneficio que Perenco pudo articular en la Audiencia sobre *Quantum* fue el supuesto conocimiento de los yacimientos por parte del Sr. Crick— y que Ecuador habría otorgado una TIR del 800%, suma que, según el Profesor Kalt, habría ascendido a USD 968 millones[177]. No obstante, esto ya formaba parte de los costos en el modelo de Brattle, junto con los demás beneficios que cualquier otro operador pudiera aportar. Así, el costo de endeudamiento de Ecuador es irrelevante: Ecuador podía contratar con otro contratista privado, como lo hizo con YPF en el Bloque 21.

204. En respuesta a las críticas de Perenco de que "el análisis del Profesor Dow supuso incorrectamente que Ecuador pudo haber percibido todos los beneficios de la prórroga —salvo la aceleración— sin costo alguno"[178], Ecuador explicó que un VAN cero (para la aceleración) no significaba que los costos fueran cero, sino que los costos ya se habían incluido en el cálculo (mediante la tasa de descuento). Brattle había asumido que Ecuador pagaría por una prórroga una rentabilidad estándar (tasa de descuento) ofrecida a los contratistas (es decir, 12%).

205. Por último, Ecuador señaló que el alegato de Perenco (para justificar sus cláusulas de prórroga poco realistas) de que Ecuador acordó en el contrato AGIP una tasa de rentabilidad de 25% sobre el capital invertido era confuso porque (i) la tasa de rentabilidad de 25% en el contrato de AGIP se refiere exclusivamente a inversiones en técnicas de exploración o recuperación secundaria, es decir, inversiones de alto riesgo[179]; y (ii) para la producción de los yacimientos existentes, el contrato de AGIP establece una tarifa de USD 35 por barril

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177 Tr. Q. (5) 1387:1 (Kalt) ("pero lo que no tiene usted es criterio") [Traducción del Tribunal]; Tr. Q. (5) 1333:5-11 (Kalt); Tr. Q. (5) 1338:20-22 (Kalt) ("[…] pero los nuevos empleados no son los que toman las decisiones, señor. La gente que toma las decisiones esenciales en los campos"); Tr. Q. (5) 1385:9-19 (Kalt); Tr. Q. (5) 1336:2-13 (Kalt).

178 Cl. PHB Q., párr. 122. [Traducción del Tribunal]

179 E-379, Contrato AGIP de fecha 23 de noviembre de 2010, Cláusula 12.3.

producido. Por lo tanto, el contrato de AGIP no representaba un bien comparable con el Bloque 7.

(iii)La Decisión del Tribunal

206. El Tribunal consideró detenidamente esta importante cuestión y comenzará exponiendo algunas conclusiones generales que guiaron su análisis.

207. En primer lugar, toma nota de los argumentos con respecto a la redacción precisa de la Cláusula 6.2 del Contrato de Participación. Acepta el argumento de Ecuador de que el Estado tenía un amplio margen de discreción cuando tuvo que decidir si otorgaría o no una prórroga. La propia Perenco aceptó que la Cláusula 6.2 era discrecional y el Tribunal no consideró persuasivo el intento del Dr. Pérez Loose de acotar el alcance de la discreción de Ecuador de modo que la prórroga del contrato fuese prácticamente obligatoria[180].

208. En segundo lugar, el Tribunal considera que aun en el escenario "contrafáctico" una prórroga, desde el punto de vista de Perenco, no habría conllevado una prórroga del Contrato de Participación existente, sino que las Partes habrían acordado que un nuevo modelo regiría su relación. Dada la manera en que se desarrollaron los argumentos de las Partes, el Tribunal considera que Perenco básicamente admitió que este fue el caso[181]. De ahí, su argumento de que, de un modo u otro, se otorgaría un contrato de prestación de servicios y la Ley 42 en 37,5% se utilizó como sustituto de los términos específicos que las Partes podrían haber acordado durante el período de prórroga si Ecuador no hubiera actuado de manera ilícita[182]. En tercer lugar, el Tribunal toma nota de las pruebas de

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180 Tr. Q. (4) 907:14-908:3 (Pérez Loose); *véanse también* Tr. Q. (3) 872:12-19 (Pérez Loose) y Tr. Q. (4) 897:14-18, 902:1-7 (Pérez Loose); Loose ER VII, párr. 52.

181 Perenco señaló: "la interpretación de la Cláusula 6.2 por parte de Ecuador que consistía en que esta cláusula solo le permitía otorgar una prórroga con respecto a la fecha de vencimiento del plazo del Contrato del Bloque 7, con exclusión de cualquier modificación del resto de las estipulaciones del contrato, carece de sustento en el lenguaje del contrato y es poco realista" [Traducción del Tribunal]. (Cl. Rep. Q., párr. 164).

182 Cl. Rep. Q., párr. 171. *Véase también* Cl. PHB Q., párr. 120: "La prueba sin refutar también demuestra que Perenco estaba dispuesta a celebrar un contrato de prestación de servicios razonable para el período de prórroga". *Cf.* Tr. Q. (1) 138:15-18 (Alegato de Apertura de la Demandante); véase también PRQ [Cl. Rep. Q], párrs. 165-170; d'Argentré WS V, párr. 24 ('Perenco estaba preparada para aceptar condiciones económicas menos favorables durante una prórroga del Bloque 7'); E-387, Diapositivas 105 y 107; Anexo

Ecuador de que hubo contratos que no se prorrogaron[183]. Esta prueba, sin embargo, no es muy convincente; el Sr. Dávalos, durante el contrainterrogatorio sobre este punto, logró identificar solo dos de tales instancias de falta de prórroga durante las tres últimas décadas[184]. Además, Ecuador no ofreció testigos que declararan que el Estado no prorrogó la gestión en cuestión en este caso y, dado que anteriormente en este proceso, diversos testigos (entre ellos, ex ministros) admitieron que Ecuador quería que Perenco siguiera operando, la falta de dicho testimonio es contundente.

209. Las pruebas que obran en el expediente, de hecho, sugieren una predisposición por parte del Estado para tratar con operadores titulares. Tal como indicara el abogado de Perenco en el argumento de cierre:

> "En 2010, el Ecuador ejecutó siete contratos enmendados, incluyendo los términos de todos ellos y, en 2014, Ecuador prorrogó los plazos de tres Contratos de Prestación de Servicios por vencer, celebrados con otros tres operadores. Es por eso que, aun si Ecuador tenía discreción para otorgar una prórroga, en tanto la ejerciera de buena fe, los hechos conducen a la conclusión de que Ecuador, de hecho, habría prorrogado el plazo de Perenco en el Bloque 7"[185].

210. Las pruebas de las prórrogas también concuerdan con el sentido común. Hay consideraciones de conveniencia que resultan del conocimiento y experiencia de los titulares en relación con las características operativas únicas de cada yacimiento petrolífero, el acceso del operador a un costo de capital inferior al que podría conseguir el Estado[186], las relaciones profesionales entre operadores y sus contrapartes en el aparato regulatorio del Estado, entre otras.

211. El Tribunal está convencido de que hay pruebas sustanciales de que, *ceteris paribus*, los funcionarios y ministros de alto rango de Ecuador habrían preferido que Perenco continuara

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BR-32, Diapositivas 36 y 37 ("Directivas sobre estrategia de prórroga del Bloque 7: . . . [c]ambiar el tipo de contrato: contrato de prestación de servicios)". [Traducción del Tribunal]

183 Tr. Q. (3) 757:11-758:12, 797:8-798:17 (Dávalos).

184 Tr. Q. (3) 757:11-758:12, 797:8-798:17.

185 Tr. Q. (6) 86:20-87:5. [Traducción del Tribunal]

186 Tr. Q. (5) 1494:1-11 (Dow); Tr. Q. (5) 1401:5-7 (Dow); *cf.* Tr. Q. (5) 1248:5-15 (Kalt).

operando el Bloque 7 en lugar de abandonarlo. Hay un conjunto de pruebas importantes en el expediente que respaldan esta conclusión, además de las pruebas generales que demuestran que Ecuador tendió a prorrogar las gestiones[187].

212. El problema principal del reclamo de prórroga es que el Tribunal no puede, en función de las pruebas ante sí, saber *qué* cláusulas contractuales se podrían haber acordado en una negociación exitosa de no haber sido por los actos ilícitos. Con respecto a la situación en el último trimestre del año calendario 2008, el Tribunal recuerda que, tal como afirmara Perenco en sus escritos durante la etapa de fondo, firmó las Actas de Acuerdo Parciales (el verdadero título de las Actas) e hizo todo lo posible para llegar a una solución aceptable para todas las partes[188]. Sin embargo, tuvo que afrontar la falta de interés de Burlington, la insistencia de Ecuador de que ambos miembros del Consorcio acordaran un nuevo arreglo y el hecho de que las propias actas no constituyeran un acuerdo jurídico vinculante.

213. En este sentido, el Tribunal recuerda las declaraciones de Perenco durante la etapa de fondo del arbitraje:

> Las Actas fueron, más bien, actas de negociaciones de las partes no vinculantes, que establecían ciertas cuestiones comerciales en función de las cuales las partes acordaron continuar sus negociaciones. RMP WS ¶¶ 31-33 y 58-59. Las Actas contenían una reserva expresa de todos los derechos; establecían *prima facie* que no eran vinculantes; y hacían expresa referencia a la necesidad de todas las partes (incluida Burlington) de ejecutar enmiendas contractuales debidamente acordadas antes de que pudieran surtir efecto los puntos asentados en las Actas. Véase RMP WS ¶ 32; véase también por ejemplo, E-84, pág. 2 ("Las partes declaran que la información contenida en las presentes Actas de Acuerdo Parcial… no será vinculante"); *ibid*. pág. 2 ("Las partes declaran que estos acuerdos se incorporarán a las negociaciones generales que se desarrollarán los días siguientes y versarán sobre los siguientes puntos: Cláusula de Arbitraje y Mediación… "); E-87, ¶ 6 y E-89, ¶ 8 ("Para la aplicación y validez de este acuerdo, las partes deben negociar y celebrar los Contratos de Participación Transitorios…"); E-87, pág. 2 ("Este acuerdo se entiende sin perjuicio de los derechos que Perenco Ecuador Limited y

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187 Según señalara Perenco en Cl. Mem. Q., párr. 146: "Solo en el año 2010, Ecuador suscribió siete contratos de petróleo modificados, mediante los que renovó los plazos de seis de los contratos originales por un período de entre seis a quince años. Visítese http://www.hidrocarburos.gob.ec/biblioteca/ (sitio web del Ministerio de Hidrocarburos, que contiene enlaces a los contratos modificados correspondientes a los Bloques 10, 14, 16, 17, MDC, PBHI y Tarapoa)" [Traducción del Tribunal]. *Véanse también* CE-331 y CE-332.

188 Cl. Rep. M., párr. 490.

> PETROECUADOR consideran que les corresponden, y no constituye una renuncia a tales derechos…") y E-89, pág. 2 ("Los acuerdos contenidos en estas actas se entienden sin perjuicio de los derechos que Perenco Ecuador Limited y PETROECUADOR consideran que les corresponden, y no constituyen una renuncia a tales derechos…"). Quedó perfectamente claro para todas las partes involucradas que no podían celebrar ningún acuerdo vinculante para enmendar los Contratos sin el consentimiento de Burlington. Véase también GCZ WS ¶ 24 (en la cual se admite que las Actas se encontraban sujetas a la aprobación de Burlington)[189]. [Énfasis agregado]

214. De hecho, al defender su incapacidad para persuadir a Burlington de que prosiguiera con las negociaciones, Perenco alegó que "no se puede culpar a Burlington por rehusarse a aceptar *el contrato sustituto vago, incompleto y riesgoso* que se le estaba ofreciendo y *a confiar en que se preservarían sus intereses económicos*"[190]. [Énfasis agregado]

215. Esta es la principal dificultad que se presenta en esta reclamación. El Acta de octubre de 2008 —el último indicio de una clara intención compartida 'en principio' de establecer una base contractual para la gestión ininterrumpida del Bloque 7 por parte del Consorcio— fue en formato de "acta" y no revistió carácter legal definitivo. La intención de las partes en ese entonces fue que, si finalmente se acordaba, el Acta sería un acuerdo transitorio que se sustituiría por algún tipo de contrato de prestación de servicios. Pero la expresión final del Acta en sí, menos aun la estipulación de los respectivos derechos y obligaciones de las partes en el contrato que seguiría, nunca se volcaron por escrito. Al fin y al cabo, el Tribunal considera que la caracterización que realizó Perenco del Acta como un "*contrato sustituto vago, incompleto y riesgos*o" ilustra las dificultades inherentes de elegir un sustituto para el escenario de prórroga del Bloque 7.

216. Perenco vio el Contrato de AGIP como sustituto de lo que habría ocurrido al Bloque 7 y advirtió sobre el hecho de que había contemplado un contrato de este tipo como parte de su estrategia de negociación de prórroga[191]. En consecuencia, esta parte de su reclamo

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189 *Ibid.*, párr. 491. [Traducción del Tribunal]

190 *Ibid.*, párr. 495. [Traducción del Tribunal]

191 *Véase* Cl. PHB Q., párr. 130: "la prórroga del contrato de prestación de servicios de Eni (AGIP) (CE-328) proporciona un fuerte respaldo para esta conclusión". Cf. Tr. (1) 149:13-22 (Alegato de Apertura de la Demandante); PMQ ¶ 153. "Se trataba de un contrato de prestación de servicios (por ende, consistente con

indemnizatorio unió los aspectos financieros de ese contrato con el programa de perforación 'contrafáctico' del Sr. Crick para el Bloque 7.

217. Pero este enfoque fracasa cuando Perenco admite que no hay pruebas en el expediente de que *Ecuador* haya considerado alguna vez que el Contrato de AGIP pudiera servir de modelo para una prórroga de la gestión del Bloque 7 para Perenco[192]. Por todos estos motivos, la idea de utilizar un contrato de prestación de servicios para el Contrato de AGIP del Bloque 10 como sustituto de lo que se pudo o no haber acordado para el Bloque 7, a fin de cuentas, va demasiado lejos para el Tribunal.

218. El Tribunal también tomó nota del hecho de que gran parte del análisis de los daños de Perenco se basa en lo que hizo Petroamazonas desde que asumió la gestión de los Bloques. Pero el Tribunal no está convencido de que la economía de las operaciones de Petroamazonas, una entidad estatal, brinde una referencia comparativa adecuada de lo que habría hecho Perenco en el escenario 'contrafáctico'[193].

219. Desde el punto de vista jurídico, el Tribunal también contempla el hecho de que las decisiones de cortes y tribunales internacionales y comisiones de reclamaciones demuestran que, aunque otorgue indemnización por daños susceptibles de apreciación pecuniaria, el órgano decisorio debe procurar no otorgar daños especulativos. Tal como destacara el tribunal en el caso de *BG Group*:

> "…Se excluirán los daños que sean "demasiado indirectos, remotos e inciertos a los efectos de su valuación". En línea con este principio, el

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la instrucción política aducida por Ecuador) en un bloque vecino en el que Ecuador aceptó una prórroga de once años, y, por lo tanto, era alrededor de un 40% más extensa que el período de la prórroga que Perenco reclama en este arbitraje. Perenco consideró específicamente un contrato de tipo Eni como parte de su 'estrategia de prórroga' contemporánea". *Véase, por ejemplo,* **E-387**, Diapositivas 105 y 107; **BR-32**, Diapositivas 36-37; *véase también* Tr. (1) 149:13-22 (Alegato de Apertura de la Demandante); PMQ ¶ 153. "Por lo tanto, el contrato Eni es un buen punto de referencia para las condiciones que Ecuador habría aceptado para una prórroga. El resultado es comparable tanto si se utiliza para corroborar el enfoque del Profesor Kalt como en calidad de enfoque sustituto" (*véase* Tr. (5) 1388:8-12 (Kalt); JK ER IV ¶¶ 5, 9 y 125-126; JK-64). [Traducción del Tribunal]

192 Tr. Q. (6) 89:21-90:3 (Alegato de clausura de la Demandante).

193 El tribunal de *Murphy c. Ecuador* adoptó un enfoque similar al rechazar el hecho de que la demandante se basara en lo que había logrado Repsol después de asumir las operaciones de Murphy. *Véase Murphy c. Ecuador*, párr. 485.

> Tribunal agregaría que otorgar de indemnización por daños especulativos equivaldría a incumplir con la 'reparación íntegra' del Proyecto de Artículos de la CDI"[194].

220. Por ende, a la luz de todas las circunstancias, el Tribunal considera que es demasiado remoto, incierto y, a fin de cuentas, especulativo aceptar el argumento de Perenco sobre la prórroga, en especial teniendo en cuenta que la propia Perenco aceptó que es necesario utilizar otros modelos contractuales como sustituto de lo que *podrían* haber acordado las Partes. Al fin y al cabo, no se puede descartar el hecho de que las partes no pudieran llegar a un acuerdo o que, por sus propios motivos, el Estado hubiera decidido en el ejercicio lícito de su facultad discrecional no prorrogar el contrato del Bloque 7. Por lo tanto, en estas circunstancias existe un grado insuficiente de confianza en cuanto a las disposiciones de un contrato que se pudo haber concluido de modo tal que hubiera un cálculo aproximado de flujos de caja perdidos.

221. Dicho todo esto, el Tribunal está convencido de que Perenco aportó pruebas persuasivas de que sufrió una pérdida de oportunidad y, además, de que su pérdida es indemnizable. El Tribunal advierte, en este sentido, que el tribunal en el caso *Burlington* resolvió que la demandante en ese caso no sustentó su reclamo de 'pérdida de oportunidad'. Pero esto apunta a una diferencia clave entre los hechos ante el tribunal de *Burlington* y los hechos ante el presente Tribunal. El tribunal de *Burlington* se vio influenciado por el hecho de que la propia Burlington asignó un valor cero a la posibilidad de una prórroga contractual en 2007[195]. Las pruebas presentadas ante este Tribunal son bastante diferentes. En línea con la Decisión del Tribunal sobre Responsabilidad, Perenco buscó maneras de preservar su presencia en Ecuador y lograr algún tipo de arreglo con el Estado[196]. De hecho, el Tribunal resolvió que el hecho de que Ecuador echara en cara contra Perenco la obstinación de Burlington constituyó un incumplimiento del Tratado[197]. Resulta también que Burlington

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194 CA-004, *BG Group c. República Argentina*, CNUDMI, Laudo Final, 24 de diciembre de 2007, párr. 428. [Traducción del Tribunal]

195 Laudo *Burlington*, párr. 282.

196 Decisión sobre Responsabilidad, párrs. 620-625.

197 *Ibid.*, párr. 626.

y Perenco discreparon sobre qué medidas tomarían[198]. En estas circunstancias, el Tribunal considera que, en el mundo 'contrafáctico' de negociaciones entre Perenco y Ecuador, había una verdadera oportunidad para el operador titular de prorrogar su gestión del Bloque 7, cuya oportunidad se perdió debido a la conducta ilícita del Estado.

222. Así pues, la pérdida de oportunidad queda establecida y es indemnizable. El cálculo de dicha pérdida por parte del Tribunal se aborda en la Sección II.I(10) *infra*.

223. La conclusión del análisis anterior es que, dado que el Tribunal resolvió que no puede suponer que la prórroga del Bloque 7 se habría basado en el contrato de AGIP o algún otro sustituto, no se pueden tener en cuenta los planes de perforación del Sr. Crick para el Bloque 7 durante el período posterior a la fecha de expiración del Contrato del Bloque 7, es decir, 16 de agosto de 2010. Al haber vencido el Contrato de Participación poco después de la expropiación, no hay motivos para considerar los planes de perforación hipotéticos que podrían haberse implementado si el Contrato se hubiese prorrogado[199].

224. El Tribunal procede a analizar los escenarios de perforación 'contrafácticos'.

(b) Programa de perforación 'contrafáctico' para el Bloque 7 desde la fecha de promulgación del Decreto 662 hasta agosto de 2010

225. Puesto que el Contrato de Participación del Block 7 venció en agosto de 2010 y en vista de la decisión *supra* del Tribunal, el Tribunal solo hará referencia al impacto del Decreto 662 en las actividades de perforación del Consorcio en el Bloque 7 hasta agosto de 2010.

(i) Posición de Perenco

226. Habida cuenta del escenario de vencimiento contractual de agosto de 2010, el Sr. Crick calculó que se perforarían 21 nuevos pozos (de un total de 70 nuevos pozos en el escenario

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198 E-91, Carta de Burlington a Perenco de fecha 16 de diciembre de 2008, en la que Burlington: "... [tuvo] intenciones de aclarar que no se encuentra obligada legalmente a firmar los contratos preliminares. Burlington puede hacer valer sus derechos en virtud de los CP [contratos de participación compartida] existentes, y esos derechos no se pueden modificar sin la participación real de Burlington". [Traducción del Tribunal]

199 El tribunal de *Burlington* llegó a la misma conclusión. Laudo *Burlington*, párrs. 271-278.

de prórroga). Perenco advierte que, tal como explicara el Sr. Crick, para el agrupamiento Oso 19-26, el pozo promedio tenía un período de recuperación de la inversión de 6 meses y tuvo un desempeño mejor incluso que el "caso elevado" que se predijo al momento de la perforación[200]. De hecho, Oso 23, el último pozo que Perenco perforó poco después de promulgarse el Decreto 662, fue el mejor[201].

227. Perenco alegó que, faltando tres años para cumplirse el plazo del Contrato del Bloque 7, en octubre de 2007, estaba lejos de encontrarse en "modo de cierre" y el Consorcio no tenía intenciones de limitar la perforación del Bloque 7 a pozos de Oso que supuestamente permitirían recuperar la inversión de perforación para mediados de 2007. Tras completarse los 8 pozos firmes Oso del Plan de Desarrollo ("POD") de 2006, el Consorcio habría comenzado con la perforación de los 8 pozos contingentes contemplados en el Plan; esos pozos se habrían recategorizado como pozos "firmes". Perenco advirtió, en este sentido, que era habitual en Ecuador presupuestar solo pozos "firmes" y que el operador luego presentara ajustes presupuestarios cuando los pozos "contingentes" pasaban a la categoría "firmes"[202].

228. Los Sres. Combe y d'Argentré declararon que la presentación de la BCM de septiembre de 2007 demostró que Perenco había ampliado, de manera sustancial, sus cálculos del petróleo de Oso, y que planificaba trasladar más personal a Oso y construir un nuevo campamento para alojarlos, y además que el Consorcio había construido la infraestructura necesaria para continuar con el desarrollo de Oso[203]. Perenco necesitaba tiempo para procesar los

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200 Presentación Directa de Crick, Diapositiva 9.

201 Crick WS III, párr. 156.

202 Cl. Rep. Q., párr. 81, que cita Crick WS III, párr. 147; d'Argentré WS IV, párrs. 9-11; Combe WS III, párr. 9.

203 Tr. Q. (2) 328:1-331:4 (Combe); Tr. Q. (2) 513:10-517:15 (d'Argentré); *cf.* RPS ER IV, párrs. 67 y 81; E-387, Diapositivas 15-17, 55-68, 85-94 y 97-99.

"increíbles resultados" de los pozos firmes antes de elegir otros emplazamientos adicionales[204]. Había una plataforma disponible para seguir perforando[205].

229. Según Perenco, si no fuera por el Decreto 662, habría seguido perforando un pozo por mes en Oso, como estuvo haciendo al momento en que entró en vigencia el Decreto 662 y habría continuado con su programa de perforación mientras le resultara redituable[206]. Perenco afirmó que esto no debería generar controversia: es indiscutible que más pozos de Oso habrían producido nuevas reservas[207] y, sin duda, Perenco había logrado previamente un cronograma de un pozo por mes en Oso[208].

230. Ningún operador racional, en medio de precios alcistas del petróleo y excelentes resultados, habría decidido no perforar más pozos[209]. En cuanto las negociaciones contractuales se encontraron encaminadas, Perenco propuso inicialmente 33, y luego 70, nuevos emplazamientos de perforación en Oso —difícilmente un sello de desilusión (como alegó RPS)[210]. Perenco habría perforado más pozos en tanto resultaran redituables y permitieran recuperar la inversión antes del vencimiento del plazo contractual. Esa perforación adicional habría resultado particularmente atractiva dado el entorno de precios altos del petróleo y el hecho de que los cálculos de la cantidad de petróleo en Oso "crecieron con cada nuevo lote de pozos"[211]. (Perenco advirtió, en este sentido, que los cálculos de Petroamazonas para Oso siguieron esta tendencia y, de hecho, fueron muy superiores al cálculo más alto de Perenco)[212].

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204 Tr. Q. (2) 488:13-489:5, 493:8-496:22, 498:3-16, 517:16-519:20; *véase también* d'Argentré WS VI párrs. 7-15; Combe WS III, párrs. 9-11.

205 Tr. Q. (2) 425:12-21 (Combe).

206 Tr. Q. (2) 504:15-505:1 (d'Argentré); Tr. Q. (3) 609:7-11; 612:8-613:1 (Crick); Crick WS II, párr. 147; Crick WS III, párrs. 143-159; *véase también* Tr. Q. (2) 331:5-16 (Combe); Combe WS II, párr. 54; d'Argentré WS V, párr. 16; d'Argentré WS VI, párr. 14.

207 Tr. Q. (4) 1110:6-18 (RPS).

208 Cl. PHB Q., párr. 25; Tabla de Pozos del Bloque 7, presentada el 15 de diciembre de 2015.

209 Cl. PHB Q., párr. 28.

210 *Véase* Anexo BR-31, Diapositiva 35 (MTO 2008); Crick WS II, Apéndice L, Diapositivas 31 y 32.

211 Cl. Rep. Q., párr. 82, en referencia a Crick WS II, párrs. 158-160; Crick WS III, párr. 144; d'Argentré WS VI, párrs. 6 y 12-14. [Traducción del Tribunal]

212 Cl. Rep. Q., párr. 82, en referencia a Crick WS II, Apéndice T; Crick WS III, párr. 144 y Apéndice P.

231. La única "incertidumbre" fue si Oso era "excelente o simplemente muy bueno"[213]. Mientras RPS señaló que el yacimiento Oso no fue tan prometedor como dijo el Sr. Crick debido a que cuatro de los 13 pozos del Hollín Principal ya se encontraban fuera de producción antes de junio de 2007, el Dr. Strickland explicó que, en cualquier yacimiento, se puede esperar que la cantidad de pozos "malos" supere la cantidad de pozos "buenos"[214]. Para RPS, sugerir que Oso tuvo, de cierto modo, un mal desempeño en función de la cantidad de pozos que se habían retirado de producción fue realmente confuso. La única razón para interrumpir la producción en Oso fue la promulgación del Decreto 662[215].

232. En cuanto a los yacimientos Lobo y Coca-Payamino, el Sr. Crick también previó desarrollos de anegación[216]. Estos se apuntaron en la Revisión Interna de 2008 de Perenco y en la BCM de septiembre de 2007[217]. El Dr. Strickland explicó que esto significaba que el agua producida se reinyectaría en el reservorio. Examinó los resultados de la anegación piloto de Perenco y concluyó que los pozos tenían la buena comunicación requerida para implementar un desarrollo de anegación. Asimismo, confirmó que la metodología del Sr. Crick fue coherente con la práctica del sector y los proyectos de anegación propuestos debían tener éxito[218]. (Perenco también sostuvo que esto fue validado por Ryder Scott, que habría producido un informe de reservas para Petroamazonas en junio de 2013)[219].

233. El análisis anterior fue revisado por el Dr. Strickland, quien concluyó que la metodología del Sr. Crick coincidió con la utilizada por otros compradores y vendedores de activos internacionales de petróleo y gas, y resultó aplicable a los yacimientos específicos objeto de revisión. Las propias cifras de producción del Dr. Strickland fueron[220]:

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213 Cl. Rep. Q., párr. 84, en referencia a Crick WS III, párr. 154; Combe WS III, párr. 13.

214 Cl. Rep. Q., párr. 88, basado en Strickland ER II, párrs. 73-79.

215 Cl. Rep. Q., párr. 84; Cl. Mem. Q., párr. 46, en referencia a d'Argentré WS V, párr. 13.

216 Cl. Rep. Q., párr. 90.

217 Cl. Rep. Q., párr. 90, en referencia a Crick WS II, Apéndice L, págs. 34 – 38; E-387, págs. 114-122.

218 Strickland ER I, párr. 87.

219 *Ibid.*, párr. 88.

220 Strickland ER II, párr. 68. [Traducción del Tribunal]

Bloque 7 Proyección de los pozos existentes Recuperación final esperada (MMStb) Producción inicial hasta el 16/08/2018			
Nombre del campo	**Método de Proyección**		
	Tasa tiempo MMStb	**Tasa cum MMStb**	**Promedio de métodos**
Oso	19,9	19,8	
Lobo	6,5	6,5	
Coca-Payamino	67,1	67,1	
Todos los demás	22,7	22,7	
Suma de los campos del Bloque 7	116,2	116,1	
			116,2
Análisis de John Crick			**118,5**

234. El Dr. Strickland señaló que el Sr. Crick había utilizado las propias tasas de producción de Petroamazonas y un análisis de curva de declinación. El Dr. Strickland realizó un análisis de pozos en Coca-Payamino, Oso y Lobo, y combinó Mono y Gacela. Al aplicar las metodologías de 'análisis de rendimiento productivo'/'análisis de curva de declinación'[221], el Dr. Strickland descubrió que el método de '*Relación Agua/Petróleo vs. Producción acumulada*' no produjo tendencias que pudieran extrapolarse a conciencia para obtener una previsión confiable[222]. En cambio, sumó los resultados obtenidos mediante las metodologías '*Tasa vs. Tiempo*' y '*Tasa vs. Producción acumulada*' para obtener la Recuperación Final Esperada ("EUR") para el Bloque 7.

235. Todos los yacimientos excepto Lobo presentaron buenas tendencias con ambas metodologías. Lobo fue la excepción porque ese yacimiento aun se estaba desarrollando con la perforación de pozos adicionales, por lo cual aun no se había establecido la curva de declinación. El Dr. Strickland realizó lo que consideró una extrapolación conservadora para Lobo. Luego, sumó las EUR para los yacimientos, calculadas mediante cada técnica, a fin

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221 Strickland ER I, párr. 42: (1) Tasa *vs.* Tiempo; (2) Curva tipo; (3) Tasa *vs.* Producción acumulada; (4) Relación agua/petróleo *vs.* Producción acumulada.

222 Strickland ER I, párr. 81.

de determinar la EUR acumulada para los pozos existentes en el Bloque 7. Promedió la EUR calculada y la comparó con la EUR que calculó el Sr. Crick. El Dr. Strickland descubrió que la EUR del Sr. Crick (118,5 MMStb) estaba muy cerca de la del Dr. Strickland, de 116,6 MMStb (apenas un 2% más alta)[223]. Las previsiones del Sr. Crick para los pozos existentes fueron, en su opinión, válidas y confiables.

236. En respuesta al argumento de RPS de que estos desarrollos eran demasiado inciertos y riesgosos, durante la Audiencia sobre *Quantum*, el Sr. Crick y el Dr. Strickland declararon que el patrón de desarrollo de "5 puntos" para las anegaciones efectivamente minimizaría los riesgos para el desarrollo y explicaría las pequeñas discontinuidades en los reservorios[224].

(ii) Posición de Ecuador

237. Según Ecuador, la Audiencia sobre *Quantum* demostró que el Consorcio no tenía intenciones de prorrogar su campaña de perforación en Oso más allá de su compromiso de 8 pozos (es decir, hasta Oso 26)[225]. La única perforación adicional que el Consorcio contemplaba más allá de esa fue en forma de inversiones "riesgosas" con el objeto de cumplir en ese entonces el requisito de inversión para el otorgamiento de una prórroga del Contrato de Participación del Bloque 7. El Consorcio, en síntesis, se mantuvo inactivo hasta tanto se le otorgara una prórroga[226]. La conclusión de RPS de que el Consorcio solo perforaría hasta 3 pozos reflejaba la estrategia establecida en la BCM de septiembre de 2007 y otros documentos contemporáneos[227], es decir, que no habría más perforación en el reservorio de Hollín Principal en Oso más allá de Oso 26 y, en cambio, se pondría el

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223 *Ibid.*, párr. 84.

224 Tr. Q. (3) 698:8-699:18 (Crick); Tr. Q. (4) 1027:14-22 (Strickland).

225 Tr. Q. (2) 490:20-491:3 (d'Argentré).

226 Resp. Rep. PHB Q., párr. 72.

227 RPS ER V, párr. 32; E-415, Presentación en la Reunión del Comité de Presupuesto del Consorcio, 28 de setiembre de 2006; E-412, Acta de Reunión del Comité de Presupuesto del Consorcio, 28 de setiembre de 2006; E-314 Reunión del Comité Informativo, 15 diciembre de 2006, pág. 3; E-414, Presentación del Consorcio, 8 de enero de 2007, pág. 29; Anexo BR-32, Presentación de MTO, 22 de marzo de 2007, pág. 53; E-387, Presentación en la Reunión del Comité de Presupuesto del Consorcio, 26-27 de setiembre de 2007, págs. 51-53.

enfoque en proyectos de "nuevas inversiones" que se llevarían a cabo si prosperaban las negociaciones para la prórroga del Contrato de Participación del Bloque 7.

238. En respuesta a las declaraciones de Perenco de que, aunque no se hubiera otorgado la prórroga, habría perforado 21 pozos nuevos en Oso a partir de enero de 2008, Ecuador alegó que no había respaldo contemporáneo para esta campaña de perforación. La BCM de septiembre de 2007 no hizo referencia a ninguna perforación más allá de Oso 26, si bien el Sr. d'Argentré admitió en la Audiencia sobre *Quantum* que dichas reuniones sirvieron como foro de debate de posteriores perforaciones[228]. Insistió con que "la gente técnica intercambió información y analizó los pozos futuros"[229]. Ni siquiera Perenco pudo aportar evidencia de esos debates, lo cual solo confirmó la falta de prueba respaldatoria de su programa de desarrollo. Se aclaró una y otra vez que toda perforación más allá de Oso 26 solo se concebía en un escenario de prórroga[230].

239. Ecuador alegó, asimismo, que la invocación por parte de Perenco de la propuesta de construcción de un nuevo campamento en Oso como prueba de la intención de llevar a cabo posteriores perforaciones fue inapropiada, ya que no constituía la "infraestructura troncal para el posterior desarrollo de Oso"[231], sino que más bien se preveía que racionalizaría las actuales operaciones de producción en el Bloque 7[232].

240. Tal como indicara el Dr. Strickland en la Audiencia sobre *Quantum*, para agosto de 2006, ya se habían alcanzado todos los límites comercialmente explotables (o fronteras exteriores) al sur, este y norte del yacimiento Oso[233]. Para fines de 2007, solo restaba determinar cuánto se extendía al reservorio Hollín Principal hacia el oeste, en línea con los resultados prometedores, si bien preliminares, de Oso 21. Tal como señalara RPS, ante esta

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228 Tr. Q. (2) 496:17-18 (d'Argentré).

229 *Id.*

230 Tr. Q. (2) 501:18-507:3 (d'Argentré); Tr. Q. (3) 628:11-629:11 (Crick); Tr. Q. (4) 1049:9-1052:11 (Strickland); Tr. Q. (4) 1088:16-1089:18 (RPS).

231 Cl. PHB Q., párr. 28. [Traducción del Tribunal]

232 E-387, Presentación en la Reunión del Comité de Presupuesto del Consorcio, 26-27 de setiembre de 2007, pág. 93.

233 Tr. Q. (4) 1049:9-1052:11 (Strickland).

incertidumbre, Perenco eligió la opción más segura de perforación interespaciada para los tres últimos pozos de Oso contemplados justo antes del Decreto 662, en lugar de seguir invirtiendo en pozos (más riesgosos) con el objeto de sondear el flanco occidental de ese yacimiento. Por lo tanto, Perenco se encontraba en "modo inactivo" hasta tanto quedara asegurada una prórroga del Bloque 7.

241. De hecho, justo antes de promulgarse el Decreto 662, el Bloque 7 no era tan próspero como lo describe Perenco en este proceso. En primer lugar, Perenco se basó erróneamente en la actualización cartográfica de Oso tras los resultados de Oso 21 para sugerir que el Consorcio "aumentó sustancialmente sus cálculos del petróleo *in situ* de Oso en función de los resultados de perforación"[234]. Sin embargo, este aumento solo se reflejó en los mapas y no se volvió a mencionar ni se cuantificó durante la BCM de septiembre de 2007[235]. Lo que es más importante, si el Consorcio hubiera estado tan entusiasmado con Oso en ese entonces como alega Perenco, el aumento del petróleo *in situ* habría alentado al Consorcio a programar otras perforaciones luego de enero de 2008. Pero no lo hizo.

242. En segundo lugar, Perenco ignoró el hecho de que no se trataba solo de algunos resultados desalentadores, sino que también la ubicación de los pozos en cuestión era desalentadora. En este sentido, RPS aludió a los "malos resultados de los primeros 18 pozos perforados en el yacimiento Oso, particularmente los resultados de los cuatro pozos fallidos del Hollín Principal"[236]. Estos 4 pozos, en los que se buscaban los bordes del yacimiento[237], indicaban un potencial limitado hacia el norte, sur, este y sudoeste del yacimiento Oso. Como resultado de ello, Oso 21 y 23 se perforaron con el fin de probar la expansión del reservorio hacia el noroeste. Según explicara RPS, los resultados combinados que arrojaron estos pozos, sumados al vencimiento inminente del contrato en 2010 y la baja calidad de los datos sísmicos en el flanco occidental, habrían persuadido al Consorcio para limitar la

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234 Cl. PHB Q., párr. 28.

235 E-387, Presentación en la Reunión del Comité de Presupuesto del Consorcio, 26-27 de setiembre de 2007, págs. 55-68.

236 Presentación Directa de RPS, Diapositiva 31; RPS ER V, párrs. 74-75 y Apéndice B. [Traducción del Tribunal]

237 Tr. Q. (4) 1049:9-1052:9 (Strickland).

perforación adicional a tres pozos de relleno (Oso 24, 25 y 26), es decir, entre Oso 21 y 23, y pozos perforados de plataforma de perforación principal del norte (Oso 9). Cuando Petroamazonas tomó el mando de las operaciones, se benefició con nuevos datos sísmicos que le permitieron seguir perforando hacia el norte y hacia el oeste[238].

243. Además, el programa de desarrollo habría requerido una reforma del Plan de Desarrollo de Oso y más autorizaciones de las autoridades ecuatorianas[239]. También, habrían requerido una mejora integral de las instalaciones del Bloque 7[240]. No solo la inminente fecha de vencimiento del contrato no habría permitido al Consorcio amortizar los USD 35 millones necesarios para llevar a cabo esta mejora, sino que tampoco había pruebas que demostraran que el Consorcio estuviera siquiera considerando esa inversión tan importante de no ser por la prórroga del Contrato de Participación del Bloque 7[241].

244. En contraposición a los cálculos del Sr. Crick y las cifras del Dr. Strickland, las cifras de RPS fueron las siguientes[242]:

4-oct-07 (Caso 1)	"Resto del Bloque 7" – En riesgo		
	Clase/categoría de reservas	Descripción	Reservas, MMStb
	1P en producción	Pozos existentes al 04-oct-2007	7,10
	1P sin desarrollar	Tres nuevos pozos "contrafácticos"	1,38
	Total 1P		8,48
	2P en producción	Pozos existentes al 04-oct-2007	8,55
	2P sin desarrollar	Tres nuevos pozos "contrafácticos"	1,84
	Total 2P		10,39

20-jul-10 (Caso 2)	"Resto del Bloque 7" – En riesgo y con ajustes		
	Clase/categoría de reservas	Descripción	Reservas, MMStb
	1P en producción	Pozos existentes al 20-jul-2010	0,18
	Total 1P		0,18
	2P en producción	Pozos existentes al 20-jul-2010	0,18
	Total 2P		0,18

238 Resp. Rep. PHB Q., párr. 75.

239 Tr. Q. (2) 375:14-381:14 (Combe).

240 Crick WS II, Apéndice C, págs. 20-21.

241 Brattle ER II, Sección IV.A.5.

242 RPS ER V, Apéndice V. [Traducción del Tribunal]

4-oct-07 (Caso 1)	Coca-Payamino – En riesgo		
	Clase/categoría de reservas	Descripción	Reservas, MMStb
	1P en producción	Pozos existentes al 04-oct-2007	3,88
	Total 1P		4,61
	2P en producción	Pozos existentes al 04-oct-2007	3,88
	Total 2P		4,61

20-jul-10 (Caso 2)	Coca-Payamino – En riesgo y con ajustes		
	Clase/categoría de reservas	Descripción	Reservas, MMStb
	1P en producción	Pozos existentes al 20-jul-2010	0,11
	Total 1P		0,11
	2P en producción	Pozos existentes al 20-jul-2010	0,11
	Total 2P		0,11

245. RPS señaló que sus cálculos para los pozos existentes se basaron en un análisis pozo por pozo, de acuerdo con las prácticas de valuación del sector[243]. La confiabilidad del análisis de RPS quedó confirmada por el hecho de que su previsión 2P "más probable" se encuentra dentro del 10% de la producción real[244]. Por el contrario, los cálculos para los tres pozos nuevos provinieron de las propias AFE de Perenco[245] con respecto a estos pozos. En el Caso 2[246], RPS previó 289.200 barriles de petróleo 1P[247] y 2P[248] de los pozos existentes en el Bloque 7[249], cifra que no fue cuestionada por Perenco.

246. Ecuador y RPS criticaron la metodología de previsión de curva tipo del Sr. Crick (porque primero determinó la tasa inicial de petróleo para sus pozos nuevos, antes de aplicar a estos

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243 *Ibid.*, Sección 2.2.

244 *Ibid.*, párr. 95.

245 Según explicara RPS en su Cuarto Informe Pericial, nota al pie 35: Una AFE —a veces, denominada Autorización para Gastos Financieros— es un documento que desglosa los costos relacionados con proyectos que requieren gastos importantes. En general, la AFE se debe presentar a la gerencia para su aprobación antes de poder comenzar con el trabajo. El "paquete de la AFE" suele incluir una justificación económica del gasto. En el caso de nuevos pozos, la justificación debe incluir, *inter alia*, proyecciones de producción sobre la vida útil del pozo que, a veces, se denomina pronóstico de producción de AFE.

246 Los pozos existentes (incluidos los pozos perforados "de no haberse promulgado el Decreto 662") al 20 de julio de 2010 hasta el vencimiento del plazo del contrato el 16 de agosto de 2010; Proyección ajustada posteriormente mediante la resta de la producción atribuible a los pozos perforados "de no haberse promulgado el Decreto 662" – *Véase* RPS ER IV, Tabla 2.

247 1P (probado).

248 2P (probado y probable).

249 RPS ER IV, Tablas 8 y 9; RPS ER V, Apéndice U.

pozos (y a los existentes) una curva tipo calculada al nivel del yacimiento). Esto podía ser muy impreciso, con un margen de diferencia de 45% con la realidad, según admitiera el propio Sr. Crick[250].

247. Las cifras de producción del Sr. Crick también fueron exageradas en relación con la producción real de los Bloques. La metodología de previsión del Sr. Crick no solo no calculó el pasado con precisión, sino que RPS también demostró que los resultados obtenidos tras aplicar la curva de declinación del Sr. Crick a cada uno de los pozos existentes de Oso desde su producción inicial hasta el 31 de marzo de 2013 excedieron de manera significativa (es decir, inflaron) la producción real de los propios pozos para los que el Sr. Crick alegó haber obtenido una coincidencia perfecta. RPS verificó, por cuenta propia, las previsiones del Sr. Crick y presentó una comparación con la producción real, que resultó en una sobreestimación de las reservas de Oso de 21 MMbo[251].

248. RPS demostró que a fin de alcanzar la supuesta "coincidencia perfecta" entre su previsión y la producción real de los pozos de Perenco, el Sr. Crick había ajustado los datos, con lo cual restó credibilidad a su técnica de validación[252]. Para los pozos nuevos, el Dr. Strickland no validó la previsión del Sr. Crick con respecto a esos pozos, lo que representó unos 99 MMbo de su previsión total de 122,5 MMbo[253]. RPS también demostró que Petroamazonas (a diferencia de Perenco) tenía la capacidad de administrar una cantidad significativa de pozos nuevos y producción de agua—aparte de los 56 pozos comprendidos en el análisis del Sr. Crick —sin restricción operativa alguna[254]. Por lo tanto, contrariamente al argumento de Perenco[255], la divergencia entre la previsión del Sr. Crick

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250 Tr. Q. (3) 635:20-637:19 (Crick).

251 Presentación Directa de RPS, Diapositiva 42.

252 *Ibid.*, Diapositivas 32-39.

253 Tr. Q. (4) 1041:6 (Strickland); *véase también* Presentación Directa de Crick, Diapositiva 3.

254 Presentación Directa de RPS, Diapositiva 33.

255 Cl. PHB Q., párr. 38.

y la producción real no se podía atribuir a las políticas operativas de Petroamazonas, sino solo a su metodología defectuosa[256].

(iii) Respuesta de Perenco

249. En respuesta a los argumentos de Ecuador y RPS, Perenco alegó que RPS había criticado erróneamente al Sr. Crick y al Dr. Strickland por emplear métodos de previsión colectivos derivados de grupos de pozos. El Sr. Crick y el Dr. Strickland habían explicado en detalle por qué los métodos colectivos se adecuaban mejor a los pozos individualmente imprevisibles del Bloque 7 que las previsiones pozo por pozo"[257]. El propio evaluador de reservas de Petroamazonas, Ryder Scott, había utilizado curvas tipo en sus previsiones para estos Bloques, tal como había hecho el Sr. Crick. El método del Sr. Crick produjo una coincidencia perfecta con la producción real de los pozos para los cuales se diseñó para predecir.

256 T. Q. (4) 1188:11-1189:L2 (RPS); Presentación Directa de RPS, Diapositiva 42.

257 Crick WS III, párrs. 14-27; Strickland ER II, Sección II. [Traducción del Tribunal]

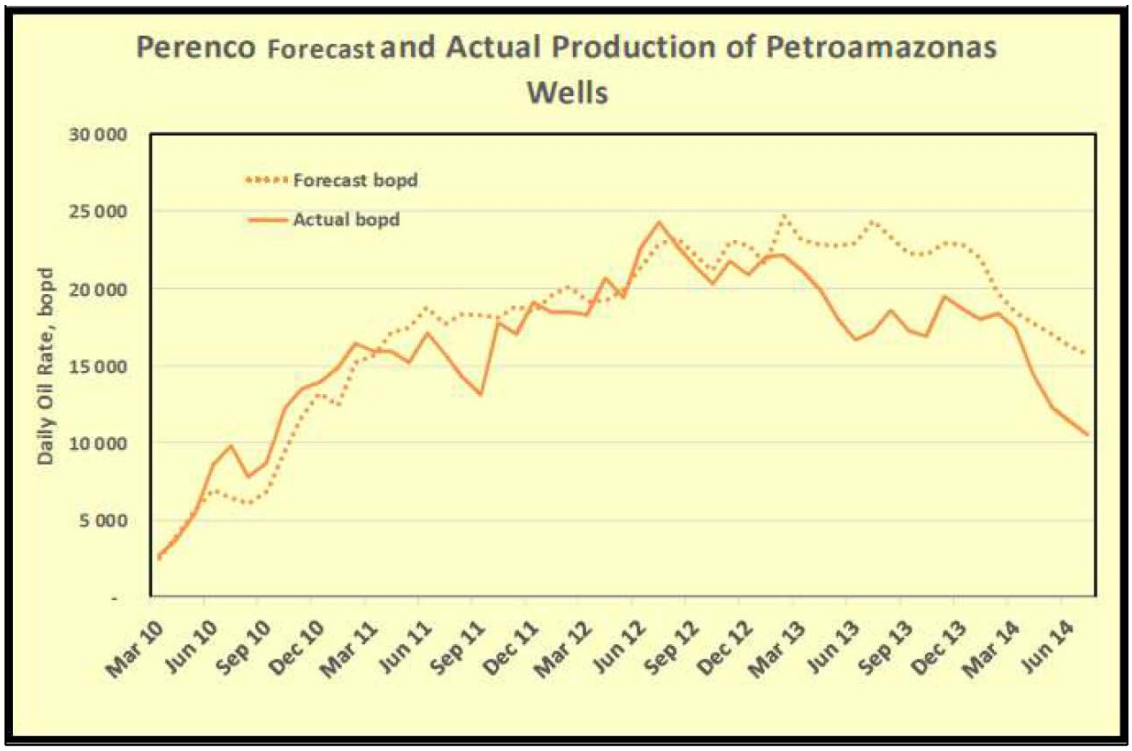

Figure 12: Comparison of forecasted and actual well performance for the new Petroamazonas wells. JC WS II, Fig. 39.

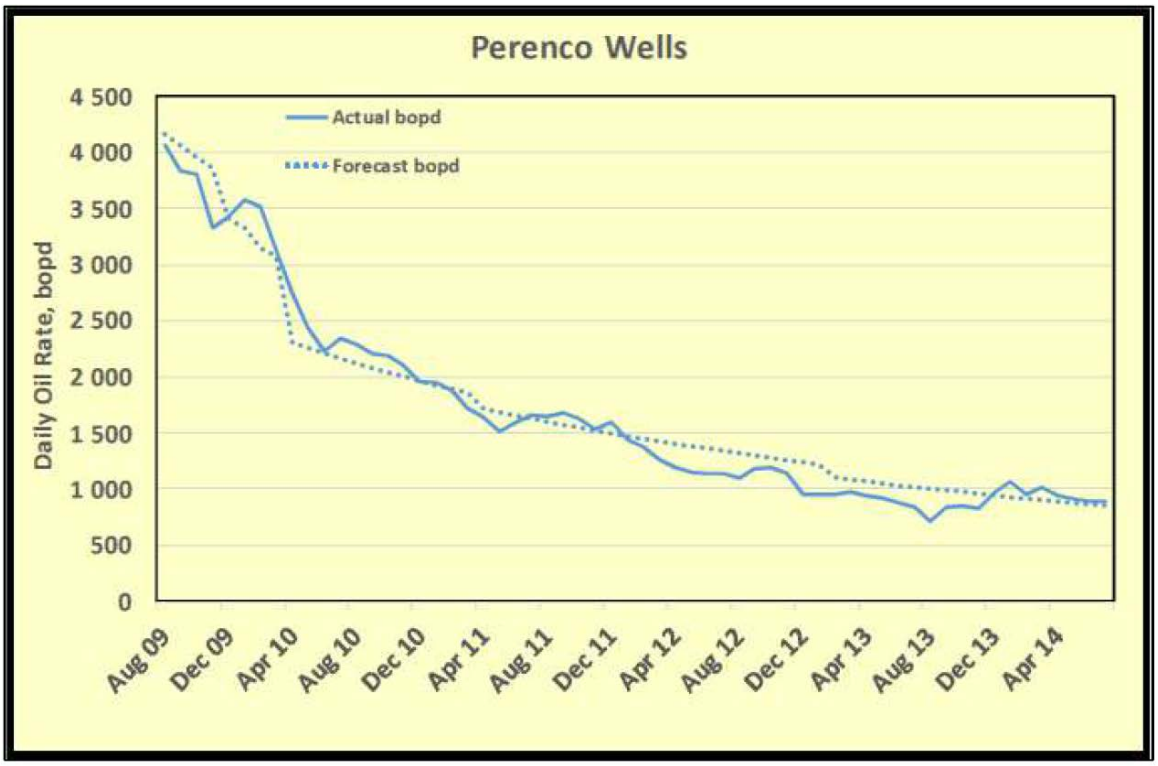

Figure 13: Comparison of forecasted and actual well performance for the Perenco-operated wells. JC WS II, Fig. 41.

250. Pese a las críticas anteriores, RPS se vio obligada a admitir en el contrainterrogatorio que los métodos del Sr. Crick produjeron, de hecho, resultados más precisos (2%) que los propios resultados de RPS (8%)[258]. La única crítica de RPS fue que el Sr. Crick no debió haber iniciado su previsión en agosto de 2009, sino al comienzo de la vida productiva de cada pozo[259]. En otras palabras, la "buena coincidencia" del método —su confiabilidad comprobada con respecto a la previsión futura— se debería desestimar porque no predice el *pasado* con precisión. Incluso, según admitiera RPS, el punto del '*análisis de la curva de declinación*' es "predecir el futuro"[260]. La propia RPS no había proporcionado una previsión que partiera del inicio de la producción de cada pozo, sino al igual que el Sr. Crick, RPS eligió un punto específico en la historia (en el caso de RPS, octubre de 2007) como punto de partida de su previsión y, luego, generó una predicción a partir de ese punto.

251. RPS no negó que la previsión independiente del Dr. Strickland para los pozos existentes del Bloque 7, que coincidían mucho con las cifras del Sr. Crick, fuera confiable y precisa.

(iv) La Decisión del Tribunal

252. En opinión del Tribunal, es un hecho que la manera de pensar del Consorcio habría estado dominada por el inminente vencimiento del contrato. El Tribunal considera que el pronunciado incremento en el precio del petróleo hasta octubre de 2007 habría inducido a Perenco a procurar perforar tantos pozos como fuera económicamente posible en el yacimiento Oso durante el plazo restante del Contrato. Según el Sr. Crick, a falta de prórroga contractual, Perenco habría dejado de perforar en el Bloque 7 en agosto de 2009, a fin de asegurar un reintegro suficiente respecto de los pozos nuevos[261]. El Sr. Crick estima que Perenco pudo haber perforado 24 pozos por año en el Bloque 7. El Tribunal acuerda y acepta los perfiles de producción del Sr. Crick.

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258 Tr. Q. (4) 1144:20-1145:6 (RPS).

259 *Véase* Tr. Q. (4) 1139:12-19 (RPS).

260 Tr. Q. (4) 1141:6-12 (RPS).

261 Crick WS II, párr. 147; Tr. (3) 612:8-21 (Crick).

253. El Tribunal está convencido de que en el escenario "contrafáctico", desde octubre de 2007, en la medida en que hubiese realizado nuevas perforaciones, Perenco se habría concentrado en el yacimiento Oso, que resultaba más predecible y técnicamente menos desafiante que la anegación más riesgosa y costosa que proponía el Sr. Crick para los yacimientos Lobo y Coca-Payamino. Señala que el propio Sr. Crick dijo, en su segunda Declaración Testimonial, que: "Lobo es uno de los dos yacimientos —el otro es el Yacimiento Unificado Coca-Payamino—, donde, *en caso de prórroga del contrato del Bloque 7*, Perenco estaba preparada para invertir en posteriores desarrollos mediante la inyección de agua"[262]. A partir de esta declaración, el Tribunal deduce que la perforación en el Yacimiento Unificado Coca-Payamino no habría ocurrido a menos que se hubiera otorgado la prórroga y, en cualquier caso, la declaración concuerda con la propia percepción de la prueba en general por parte del Tribunal.

254. Por lo tanto, el Tribunal cree que la perforación que habría ocurrido en el Bloque 7 si no se hubiera sancionado el Decreto 662 habría afectado solo al yacimiento Oso.

(v) Conclusión sobre el cálculo de cuántos pozos del Bloque 7 se habrían perforado hasta agosto de 2009

255. En opinión del Tribunal, el Consorcio habría perforado cuatro pozos para enero de 2008 y 19 en el período comprendido entre febrero de 2008 y agosto de 2009. Por eso, utilizó esta cifra y cronograma de perforación de pozos al calcular los daños que sufrió Perenco hasta la fecha de la expropiación.

(c) El programa de perforación 'contrafáctico' del Bloque 21 hasta la caducidad

256. Tal como se señalara *supra*, la valuación de este Bloque es un proceso de dos pasos. El primer paso consiste en calcular los flujos de caja futuros resultantes del Decreto 662 al 4 de octubre de 2007 (calculados sobre la supuesta base de que el Contrato habría estado en vigencia hasta su fecha de vencimiento). El segundo paso requiere calcular los flujos de caja futuros al 20 de julio de 2010 para el Bloque 21. El 20 de julio de 2010 es la fecha de

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262 Crick WS II, párr. 203. [Traducción del Tribunal] [Énfasis agregado]

declaración de caducidad que puso fin al plazo de vigencia restante del Contrato de Participación.

257. Tal como se comentara *supra*, el segundo cálculo se realiza en una "estado financiero limpio". Es decir, en lugar de considerar el efecto de depreciación del Decreto 662 en el valor de los activos hasta la fecha de caducidad del Contrato, en palabras de Perenco, se recortarán los flujos de caja perdidos iniciales aproximados para el Bloque 21 a la fecha de la segunda valuación, y los daños adjudicados para ese período, con lo cual se realizará una nueva valuación en función de las condiciones imperantes en el mercado el día antes de emitirse la declaración de caducidad, y se efectuará una segunda adjudicación de daños en relación con la pérdida del plazo restante de Contrato, sobre la base de las condiciones del mercado y las supuestas expectativas del operador en el escenario 'contrafáctico' de julio de 2010.

(i) Posición de Perenco

258. Perenco explica que, al momento de la implementación del Decreto 662 en octubre de 2007, había recorrido solo una tercera parte del período de su gestión del Bloque 21, con casi 14 años por delante de la fecha de extinción del Contrato en junio de 2021. El programa de desarrollo 'contrafáctico' del Sr. Crick se ocupaba, por lo tanto, de este largo período de tiempo que restaba de la duración del Contrato. De los 24 pozos calculados, 21 serían pozos de relleno perforados en la parte desarrollada central del yacimiento Yuralpa, que contenían una columna de petróleo de, al menos 90 pies, y los tres pozos restantes estarían ubicados fuera de esta área[263]. En opinión del Sr. Crick, se habrían recomendado los pozos de relleno por el mecanismo de conificación del agua. Perenco advirtió que los peritos de Ecuador,

263 El Sr. Crick supone que comenzará en enero de 2008, en vez de julio de 2008, tal como se propuso en la BCM de setiembre de 2007, sin la conducta coercitiva de Ecuador, anteriormente debido, en particular, al aumento en los precios del petróleo en aquel entonces. La diferencia de fecha solo genera una reducción general de 2% en las cifras del Sr. Crick. El Sr. Crick ha proporcionado perfiles revisados que utilizan julio de 2008 como fecha de inicio de la nueva perforación de Yuralpa. Esto agrega un nivel de conservadurismo a la previsión de producción del Sr. Crick. El Profesor Kalt, a su vez, utilizó los perfiles revisados del Sr. Crick en su cálculo de daños actualizado.

RPS, aceptaron que la perforación de relleno generaría nuevas reservas. La mitad de los pozos propios que propuso RPS eran claramente de relleno[264].

259. Perenco señaló que, a diferencia del enfoque del Sr. Crick, RPS, que ya había alegado en el caso *Burlington* que "la perforación adicional no se justificaba en Yuralpa en modo alguno porque el yacimiento se encontraba completamente desarrollado [en 2007]"[265], había cambiado de parecer en este proceso y ahora proponía un programa limitado de seis pozos[266]. Perenco señaló que aun su más mínimo compromiso de inversión en sus negociaciones de 2008 con Ecuador *después* de promulgarse el Decreto 662, que contemplaba operaciones bajo condiciones económicas mucho menos favorables que las que se incluyeron en el Contrato de Participación, incluía siete pozos de Yuralpa[267].

260. El Dr. Strickland evaluó la previsión del Sr. Crick así como el rendimiento previsto de RPS con respecto a los seis nuevos pozos de Yuralpa que, a su criterio, se habrían perforado. Concluyó que ambos programas eran posibles y la cuestión fue cuál era más racional. En su opinión, el plan de desarrollo del Sr. Crick era más racional en términos de los volúmenes previstos y reflejaba mejor qué haría un operador prudente para maximizar su producción, mientras que RPS no pudo explicar por qué un operador prudente dejaría de perforar después de la perforación de seis pozos exitosos en un yacimiento tan grande[268].

261. El Dr. Strickland había opinado que las características críticas del reservorio de Hollín Principal que afectaban su capacidad de producción eran las siguientes[269]:

1. Cantidad de petróleo: Había una gran cantidad de petróleo en el Hollín Principal. Puesto que a la fecha se había recuperado un bajo porcentaje, era probable que la recuperación final fuera aun mayor de lo que había previsto el Sr. Crick. Según el Dr. Strickland, si los precios del petróleo eran lo suficientemente altos, se podría recuperar aun más petróleo que lo previsto por el Sr. Crick.

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264 Cl. Rep. Q., párr. 75; Crick WS III, párrs. 88-90 y Figura 9.

265 CE-335, párr. 144. [Traducción del Tribunal]

266 RPS ER IV, párr. 167.

267 Cl. Rep. Q., párr. 69.

268 Strickland ER II, párr. 46.

269 Strickland ER I, párr. 15.

2. Geología y entorno de depósito: En el yacimiento Yuralpa, la mayor parte del petróleo se halló en el nivel superior del reservorio de Hollín Principal, que consiste en cauces trenzados. Los cauces trenzados del Hollín Principal tenían una porosidad de 20-25%, que se consideraba excelente para la recuperación de petróleo. Los cauces trenzados también tenían una alta permeabilidad. La porosidad y la permeabilidad eran dos características decisivas porque indican si el petróleo era capaz de desplazarse a través del reservorio hasta el pozo.

3. Conducción de agua: Yuralpa era un "reservorio inferior de conducción de agua" [Traducción del Tribunal]. A medida que se producía petróleo, el agua rellenaba los poros del reservorio, lo que generaba una presión constante de 3300 psi. La cantidad de agua proveniente de un pozo en un reservorio de conducción de agua aumentaba con el tiempo a medida que el agua invasora llegaba al pozo. Por lo general, la recuperación de petróleo *in situ* en los reservorios de conducción de agua era alta.

4. Petróleo viscoso: El petróleo en el Hollín Principal era relativamente pesado y viscoso, lo que facilitaba al agua subterránea del acuífero atravesar el petróleo si se la atraía hacia arriba en dirección al área de baja presión alrededor de las perforaciones de pozos. Esto llevaría a la creación de "conos de agua".

5. Presencia de esquistos: Los esquistos, que son un tipo de roca no productiva de baja permeabilidad, que impide el movimiento de los líquidos, se encontraban distribuidos al azar en el Hollín Principal. Los registros del Hollín Principal confirmaron la presencia de esquistos en varias perforaciones de pozos en Yuralpa y Oso. Sin embargo, la ubicación y la superficie de los esquistos no se podía predecir con exactitud en el área entre los pozos en función de la información de los pozos existentes.

262. Perenco alegó, asimismo, que RPS basó incorrectamente todo su plan de desarrollo para el Bloque 21 en una propuesta realizada en una Reunión del Comité de Presupuesto (BCM) del Consorcio, celebrada en septiembre de 2007. No tenía sentido suponer que el Consorcio habría propuesto y aprobado un plan de desarrollo integral para los 14 años restantes del Contrato del Bloque 21. Además, los seis pozos que propuso RPS producirían más de un millón de barriles cada uno. Con esa previsión de pozos productivos, no tenía sentido suponer que el operador aceptaría no tomar ninguna otra medida en los años subsiguientes.

263. El testimonio durante la Audiencia sobre *Quantum* dejó en claro que los pozos de relleno 'contrafácticos' de Perenco en Yuralpa producirían nuevas reservas. Tal como demostrara el Dr. Strickland en su presentación, el propio modelo de RPS desmintió la antigua negativa por parte de RPS en relación con la conificación del agua y su afirmación de que "no hay

zonas disponibles que sean un buen lugar para hacer la perforación intensiva"[270]. De hecho, el argumento acerca de los pozos interespaciados era mejor que lo que había demostrado el modelo de RPS: mediante la corrección del claro error del modelo de RPS y utilización del espaciado apropiado de 40 acres entre los pozos existentes, los pozos intercalados simulados producen aun más petróleo[271].

264. Por lo tanto, Perenco alegó que, a pesar de la "negativa desconcertante" del Dr. Gorell a denominar "cono" una "forma cónica"[272], ya no había ninguna duda de que la perforación intercalada entre el agua de los pozos existentes sería productiva. De hecho, RPS se manifestó explícitamente "de acuerdo con que se va a producir petróleo [a partir de los pozos intercalados]"[273]. La única discusión restante tenía que ver no con la producción de petróleo, sino con la producción de agua asociada[274]. Al respecto, RPS alegó, por primera vez, en su informe presentado junto con su Dúplica, que la producción de agua asociada con los pozos del Sr. Crick superaría, de manera sustancial, el límite de 120.000 barriles de agua por día (*bwpd*) que impuso el Sr. Crick[275].

265. Antes de la Audiencia sobre *Quantum*, Perenco había criticado a RPS por no utilizar el modelo de simulación de Yuralpa, que servía para generar sus previsiones de Yuralpa, de manera razonable[276]. Por ejemplo, RPS no asumió la conducta de un operador racional que habría permitido que la tasa de extracción de líquidos del yacimiento (la cantidad de

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270 Cl. PHB Q., párr. 41, en referencia a RPS ER V, Ap. O, párr. 27. Tr. Q. (4) 1008:10-1019:3 (Strickland); Presentación de Strickland en 9-23; *véase* Exhibición de Modelos de Strickland, presentados el 15 de diciembre de 2015.

271 Tr. Q. (4) 1019:4-1020:2 (Strickland). El Tribunal advierte que el Sr. Crick y el Dr. Strickland propusieron 40 acres en los informes periciales; sin embargo, el Dr. Strickland habló de 50 acres durante su presentación directa (apartándose del modelo de RPS) y también reprodujo el espaciamiento de 70 acres de RPS. Sostuvo que se produciría más petróleo con el espaciamiento de 70 acres: Tr. Q. (4) 1019:13-18: "Si ustedes quieren 70 acres, esos 70 acres por pozo es un cuadrado de (1746) pies de cada lado. Eso es un espaciamiento mayor. Si desean un espaciamiento mayor, hay más petróleo en sitio y eso va a aumentar la recuperación y el ingreso de agua".

272 Tr. Q. (4) 1189:1-4 (RPS).

273 Tr. Q. (4) 1075:14-1076:1 (RPS).

274 Tr. Q. (4) 1076:2-4 (RPS).

275 Tr. Q. (4) 1085:2-1086:14 (RPS); RPS ER V, párrs. 205-211.

276 Cl. Rep. Q., párrs. 103-104.

líquidos producidos mediante las operaciones) aumentara con el tiempo[277]. Los propios resultados de RPS indicaron que aun un módico aumento en la producción de agua del yacimiento aumentaba la producción de petróleo significativamente[278]. Sin embargo, RPS decidió mantener niveles bajos de extracción, sin explicar por qué Perenco actuaría de un modo tan irracional[279].

266. Tal como explicara el Sr. Crick, en un reservorio de conducción de agua como Yuralpa Hollín, donde un potente acuífero subyace todo el petróleo y podría invadir los pozos, un aumento en la capacidad de manejo de agua era esencial para maximizar la productividad de los yacimientos[280]. En otras palabras más simples, para producir mayores volúmenes de petróleo, el operador debe estar preparado para producir y procesar volúmenes de agua aun mayores. Como bien sabía RPS, el Sr. Crick utilizó un límite de 120.000 barriles por día en todo el yacimiento[281]. Sin embargo, RPS no dijo nada respecto del límite que propuso el Sr. Crick, como tampoco brindó explicación alguna acerca de su decisión de restringir sus propias previsiones con límites muy inferiores. De hecho, el Sr. Crick demostró que, según los datos más recientes, su cálculo de agua inicial era realmente pesimista y la producción de agua a partir de sus nuevos pozos propuestos sería perfectamente manejable[282]. La única objeción técnica de RPS (que la producción de agua asociada con los pozos del Sr. Crick superarían, de manera sustancial, el límite de 120.000 barriles de agua por día que impuso el Sr. Crick) fue, por ende, inválida. Es por eso que el único motivo técnico de RPS para oponerse al plan de desarrollo de Yuralpa del Sr. Crick es inválida.

267. Asimismo, Perenco alegó que, a diferencia del plan del Sr. Crick, la Audiencia sobre *Quantum* reveló que el propio cálculo de producción de agua de RPS se basó en un error fundamental: confiar en que el modelo de estudio de campo de Yuralpa arrojaría una previsión precisa de la producción de agua. El Dr. Strickland demostró que esto es lo que

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277 Crick WS III, párrs. 56-63.

278 *Véase* RPS ER IV, Ap. E, Tablas 2, 3, 5 y 6; Crick WS III, párrs. 57-59.

279 Crick WS III, párrs. 60 y 108.

280 Crick WS III, párrs. 56 y 63; Crick WS II párrs. 47-55, 77-81, 166 y 197-200; *véase* Strickland ER II, párr. 36.

281 Crick WS III, párr. 61.

282 Tr. Q. (3) 625:11-627:9; 683:6-19 (Crick); Presentación Directa de Crick, Diapositivas 27-33.

hizo RPS. El defecto de esa metodología fue que el modelo no contenía esquistos que bloquearan el agua por debajo de los pozos intercalados simulados (por lo tanto, fue una situación pesimista). Desde luego, dicho modelo pronosticaría una abundante producción de agua, cuando en realidad la presencia de esquistos *reduciría*, de manera sustancial, la producción de agua. El Dr. Strickland explicó que los modelos de yacimientos plenos en situaciones en las cuales hay esquisto que bloquea la producción de agua no es una buena herramienta para pronosticar[283]. Los datos reales demuestran que el modelo es empíricamente erróneo: predice una relación agua/petróleo (*WOR*) mucho mayor que aquella observada en el yacimiento[284].

268. Perenco también señaló que RPS utilizó indebidamente un gráfico que representa la WOR de Yuralpa como una función de producción acumulada. RPS realizó una previsión de producción de agua para pozos existentes y nuevos mediante un gráfico de WOR que solo contempla el comportamiento de los pozos existentes de Yuralpa[285]. Esto no tenía sentido, ya que suponía que los nuevos pozos no agregarían reservas, lo que es indiscutiblemente falso.

269. Por último, además de vindicar el plan de desarrollo de Yuralpa del Sr. Crick desde el punto de vista técnico, las pruebas también refutaron el argumento de Ecuador de que el panorama en Yuralpa era tan "negativo" y "desalentador" que Perenco simplemente abandonaría el yacimiento[286]. Por el contrario, las recuperaciones por pozo inferiores a lo previsto obligaron a Perenco a perforar más pozos, aunque fueran marginalmente rentables, con el objeto de recuperar su inversión[287]. Los pozos seguían dando ganancia y, según indicara el Sr. Caldwell de la firma The Brattle Group, si Perenco tenía motivos para perforar incluso

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283 Tr. Q. (4) 1024:6-13 (Strickland); *véase también* Tr. Q. (4) 1038:8-21 (Strickland) (acerca de la producción de agua en el modelo de cuatro pozos de RPS de su Quinto Informe).

284 Tr. Q. (3) 624:13-625:10 (Crick); Presentación Directa de Crick, Diapositiva 26; Tr. Q. (4) 1025:6-12 (Strickland).

285 Tr. Q. (4) 1085:4-1086:14 (RPS); Presentación Directa de RPS, Diapositiva 19; RPS ER V, párr. 210, Figura 2.

286 *Véase, por ejemplo*, Tr. Q. (1) 245:14-21 (Alegato de Apertura de la Demandada); Tr. Q. (2) 384:17-19, 393:12-15 (Combe); Tr. Q. (2) 477:13-478:14 (d'Argentré); Tr. Q. (3) 653:5-10 (Crick).

287 Tr. Q. (2) 411:1-12, 412:13-413:2, 417:4-19 (Combe); Tr. Q. (2) 478:10-479:4 (d'Argentré).

pozos marginales, no hay razones económicas para no hacerlo[288]. Por lo tanto, los seis pozos nuevos del Estudio de Yuralpa de 2007 solo pueden ser un mínimo, no un máximo —un plan para la siguiente serie de trabajos, no para la serie completa de trabajos[289]. El propio Estudio de 2007 describe "nuevos pozos intercalados" e indica otros análisis que se deben llevar a cabo para tales pozos[290].

270. El Dr. Strickland también analizó los volúmenes de producción previstos del Sr. Crick, conforme a su plan de perforación, mediante una serie de pruebas y los planes de perforación reales ejecutados por Petroamazonas. Asimismo, consideró las características críticas del Hollín Principal que afectaban su capacidad de producir petróleo, según se explica en el párrafo 261 *supra*[291]. El Sr. Crick previó que los pozos existentes recuperarían 52,1 MMStb[292] de petróleo y los nuevos pozos previstos de 11,3 MMStb[293].

271. El Dr. Strickland advirtió que la presencia de conificación del agua y los efectos del esquisto que bloqueaba el agua se encontraban documentados en Yuralpa[294]. Debido a la imprevisibilidad de la ubicación y la magnitud del esquisto, resultaba difícil extrapolar el rendimiento individual de los pozos en el Hollín Principal a fin de predecir la producción del reservorio con un nivel de seguridad razonable, dado que había importantes diferencias entre los pozos; sin embargo, era más fácil determinar cuánto produciría probablemente el siguiente grupo de pozos[295].

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288 Tr. Q. (5) 1508:4-22 (Brattle).

289 *Ibid.*

290 Crick WS II, Apéndice E, pág. 3.

291 Strickland ER I, párr. 15.

292 Crick WS II, párr. 121, señaló que la producción de los pozos existentes en el Bloque 21, perforados hasta enero de 2008, fue de 20,19 millones de barriles. La producción adicional de los pozos originales de Perenco entre esa fecha y la extinción del contrato en junio de 2021 se vería afectada por los nuevos pozos, calculada en 31,84 millones de barriles, lo que da una recuperación total a partir de los pozos originales de Perenco de 52,03 millones (20,19 desde 2004 hasta enero de 2008 + 31,84 desde febrero de 2008 hasta junio de 2021).

293 Crick WS III, Figura 1.

294 Strickland ER I, párr. 30.

295 *Ibid.*, párr. 34.

272. El Dr. Strickland también confirmó que el petróleo adicional entre los pozos se podía recuperar mediante perforación intercalada, es decir, la colocación de nuevos pozos, tal como sugirió el Sr. Crick en su plan de desarrollo para Yuralpa[296]. Esos pozos adicionales serían necesarios si el operador tenía intención de capturar las grandes cantidades de petróleo remanentes en el yacimiento de Yuralpa[297].

273. El Dr. Strickland analizó las previsiones del Sr. Crick mediante cuatro tipos de '*análisis de rendimiento productivo*'/'*análisis de curva de declinación*':

1. Tasa *vs.* Tiempo
2. Curva tipo
3. Tasa *vs.* Producción acumulada
4. Relación agua/petróleo *vs.* Producción acumulada[298]

274. Comprobó que la aplicación del análisis de curva tipo por parte del Sr. Crick fue coherente con los métodos de la industria para la previsión de la producción futura en yacimientos donde no se registraba un buen comportamiento de los pozos individuales (es decir, donde los datos de producción graficados para cada uno no siguen una tendencia predecible)[299]. Confirmó que los datos correspondientes a estos pozos no reflejaban un buen comportamiento por pozo[300]. No obstante, los datos sí reflejaban un buen comportamiento cuando las predicciones se referían a grupos o a todo un yacimiento. El Dr. Strickland aplicó las cuatro técnicas a un análisis de yacimiento completo en agosto de 2009 y, luego, a cada grupo de pozos según el año en que se perforaron. Tras comparar los cálculos del Sr. Crick con sus cifras calculadas de manera independiente, el Dr. Strickland comprobó

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296 *Ibid.*, párrs. 35-36.

297 *Ibid.*, párr. 37.

298 *Ibid.*, párr. 42. El Dr. Strickland explicó que esta técnica traza la relación agua/petróleo ("WOR") en el eje "y" y la producción acumulada de petróleo en el eje "x". Este tipo de gráfico sirve para pozos que producen una gran cantidad de agua en comparación con la del petróleo, como ocurre en los pozos del Hollín Principal. Si solo se tienen en cuenta las tasas de petróleo, el cálculo de las reservas en tales circunstancias puede resultar pesimista. El recorte económico habitual es una WOR de 49, lo que significa que por cada barril de petróleo se producen 49 barriles de agua. Una WOR de 49 equivale a un corte de agua del 98%.

299 *Ibid.*, párr. 49; explica la definición de pozos con buen comportamiento en el párr. 44.

300 *Ibid.*, párr. 50.

que los cálculos del Sr. Crick encuadraban en sus cálculos independientes y, por lo tanto, estaba convencido de que el Sr. Crick calculó, de manera racional y válida, las reservas y la EUR de los pozos existentes en el yacimiento Yuralpa[301].

275. Para los pozos nuevos que el Sr. Crick previó para el Bloque 21, el Dr. Strickland aplicó una metodología diferente porque no había información histórica. Comprobó que el método de previsión del Sr. Crick era coherente con las prácticas del sector[302]. Teniendo en cuenta que los pozos perforados con posterioridad presentarían tasas iniciales inferiores y una EUR por pozo, el Dr. Strickland trazó la EUR promedio por pozo para el mismo grupo de pozos y descubrió una tendencia de buen comportamiento, lo que le permitió brindar una predicción de la EUR promedio por pozo para el siguiente grupo de pozos perforados en Yuralpa[303]. Confirmó que las previsiones del Sr. Crick eran racionales y probablemente conservadoras[304]. Las cifras del Dr. Strickland fuero las siguientes[305]:

Bloque 21 Yuralpa Proyección de los pozos existentes Recuperación final esperada (MMStb)						
Grupo de pozos	**Pozos incluidos**	**Método de proyección**				
		Tasa tiempo MMStb	**Tasa cum MMStb**	**WOR Cum MMStb**	**Tipo de curva MMStb**	**Promedio de 4 métodos**
1	**Perforación 2004**	12,5	12,4	13,3	14,5	
2	**Perforación 2005**	20,2	20,0	23,7	23,2	
3	**Perforación 2006-7**	15,7	15,6	18,3	18,3	
	Suma de los grupos 1, 2 & 3	48,4	48,0	55,3	56,0	**51,9**
4	**Todas las operaciones de Perenco**	47,9	48,0	62,6	53,3	**53,0**
Análisis de John Crick					**52,1**	

301 *Ibid.*, párr. 51.

302 *Ibid.*, párr. 68.

303 *Ibid.*, párrs. 68 y 69.

304 *Ibid.*, párr. 71.

305 Strickland ER II, párr. 41. [Traducción del Tribunal]

276. Al utilizar el modelo numérico de comparación histórica de Perenco, desarrollado en 2007 y luego actualizado[306], el Dr. Strickland confirmó que quedaba suficiente petróleo en ubicaciones no barridas como para perforar los 24 pozos previstos por el Sr. Crick[307].

277. Si bien se admitió que la correlación del Sr. Crick era imperfecta[308], Perenco señaló que dicha correlación representó una base útil y conservadora para prever la producción de los nuevos pozos. El análisis de la curva de declinación fue una herramienta de previsión confiable en la cual, como aquí, hay motivos para creer que Perenco seguiría realizando las obras e inversiones necesarias—tal como hizo Petroamazonas[309]. Si bien RPS había alegado en su Quinto Informe que el Sr. Crick utilizó una técnica de promediación inapropiada para crear este tipo de curvas, el Sr. Crick señaló que esto no fue cierto y RPS no intentó retomar este punto[310].

278. Perenco afirmó también que RPS defendió la adopción de una tasa de declinación de 17% proveniente del contrato del Bloque 21 de Petroamazonas con YPF que RPS había rechazado explícitamente en el caso *Burlington*. Luego de admitir que nunca se debería haber utilizado esta tasa, RPS intentó alcanzar la misma tasa de declinación abrupta mediante extrapolación de la declinación del yacimiento durante un período que incluyó el impacto negativo del Decreto 662[311]. En el contrainterrogatorio, el Dr. Gorell acordó que cualquier extrapolación debía orientarse hacia la relevancia de hechos históricos[312].

279. Perenco sostuvo además que las previsiones del Sr. Crick fueron verificadas mediante otras fuentes independientes, incluso cálculos posteriores de Petroamazonas, Ryder Scott y el Dr. Strickland. Por otro lado, RPS no ofreció ninguna crítica con respecto a las predicciones

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306 Referencia 5 de Strickland.

307 Strickland ER I, párr. 76.

308 Tr. Q. (3) 619:13-18, 638:21-640:5 (Crick).

309 Cl. PHB Q., párr. 46.

310 Tr. Q. (3) 620:11-17 (Crick).

311 Cl. PHB Q., párr. 52, en referencia a Tr. Q. (4) 1175:14-17 (RPS) (acerca de RPS ER V, Apéndice Q, Figura 3).

312 Cl. PHB Q., párr. 52; Tr. Q. (4) 1175:18-1176:17 (RPS).

de Yuralpa del Dr. Strickland y Ecuador no contrainterrogó al Dr. Strickland acerca de sus métodos o resultados de predicción[313].

280. Sobre la base del trabajo técnico del Sr. Crick, analizado por el Dr. Strickland, el Profesor Kalt luego calculó el valor del Bloque 21 que Perenco había dejado de lado como resultado de las violaciones contractuales y del Tratado por parte de Ecuador. Calculó que los daños de Perenco provenientes del Bloque 21, sufridos como consecuencia de los incumplimientos, ascendían a USD 501,5 millones, si se calculaban *ex ante*[314], y USD 651,6 millones, si se calculaban *ex post*[315].

(ii) Posición de Ecuador

281. En opinión de Ecuador, el Consorcio solo habría perforado hasta 6 nuevos pozos en Yuralpa, no 24.

282. Ecuador observó que era indiscutible que el yacimiento de Yuralpa fue el primer proyecto *greenfield* de Perenco y que su desarrollo estuvo repleto de desafíos imprevistos y resultados inesperadamente negativos. Tal como admitiera el Sr. Combe, tras la pérdida repentina e inexplicable de sus dos mejores productores en 2004, el yacimiento nunca más volvió a cumplir con el compromiso de *ship or pay* del Consorcio de 20.000 barriles de petróleo por día[316], pese al monto invertido, que era sustancialmente mayor de lo previsto originalmente[317]. Las campañas consecutivas de perforación también arrojaron resultados desalentadores.

283. En este contexto, Perenco detuvo la perforación en febrero de 2007 (meses antes de promulgarse el Decreto de 662) y, en un intento por abordar los grandes desafíos encontradas en Yuralpa, encargó un innovador estudio de campo completo. Los resultados preliminares de este estudio se presentaron en la BCM de septiembre de 2007. Esto y una

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313 Cl. PHB Q., párr. 53.

314 Anexo JK-64, escenario de Prórroga del Contrato de Participación Compartida de 2010.

315 *Id.*

316 Tr. Q. (2) 383:11-14 y Tr. Q. (2) 388:22-389:6 (Combe); *véase también* E-155, Tabla de análisis de datos de producción de petróleo por Bloque, yacimiento y reservorio de los Bloques 7 y 21, pág. 5.

317 Tr. Q. (2) 385:17-386:1 (Combe); *véase también* Tr. Q. (2) 333:22-334:6; Tr. Q. (2) 411:13-20 (Combe).

versión ligeramente refinada y definitiva del Estudio de Simulación de Yuralpa emitida por Perenco en junio de 2008 identificaron dos áreas sin barrer en las que los pozos existentes por sí solos no habrían drenado el reservorio para 2021. Como resultado, durante la BCM de septiembre de 2007 se presentó un programa preliminar de entre seis y ocho nuevos pozos en el área principal y en el límite sudeste del yacimiento, que se perforarían a partir de julio de 2008. Esto se redujo luego a entre cinco y siete pozos en el posterior Estudio de Simulación, con el fin de barrer efectivamente el reservorio[318].

284. En consecuencia, RPS concluyó que, de no ser por el Decreto 662, se habrían perforado seis pozos nuevos en Yuralpa desde julio de 2008 en adelante: dos en el área principal del yacimiento, tres en el límite sudeste y una nueva perforación hacia el sur[319]. Ecuador rechazó el argumento de que RPS había cambiado de posición entre los arbitrajes de *Burlington* y *Perenco*; ambos tribunales habían dirimido la cuestión de manera diferente y, por lo tanto, debían adoptarse perspectivas diferentes[320].

285. El supuesto programa de perforación de 24 pozos de Perenco, que habría comenzado en julio de 2008, fue en contra de la presentación de Perenco durante la BCM de septiembre de 2007 y el Estudio de Simulación de Yuralpa emitido en junio de 2008, que contemplaba perforar entre cinco y (no más de) siete pozos horizontales, con el objeto de barrer efectivamente las dos áreas que, de lo contrario, habrían quedado sin drenar para el año 2021.

286. Ni el Estudio de Simulación de Yuralpa ni cualquier documento contemporáneo daban a entender y, mucho menos, demostraban que había una cuestión importante con respecto a cómo el departamento de Geociencias de Perenco desarrolló el Estudio o construyó su modelo vanguardista. Tampoco se criticaron o, de algún modo, se impugnaron las conclusiones y recomendaciones anteriores al testimonio del Sr. Crick. El Estudio

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318 Crick WS II, Apéndice E, Estudio de Campo de Yuralpa, págs. 2, 32 y 34.

319 Crick WS II, Apéndice E, Estudio de Campo de Yuralpa, Figura 161; *véase también* Tr. Q. (4) 1069:4-8 (RPS).

320 Resp. Rep. PHB Q., párr. 67; RPS ER V, Sección 2.4; RPS ER V, Sección 2.4.

simplemente no contempló la necesidad o, de hecho, no identificó el beneficio de proceder con una campaña de perforación intercalada exhaustiva en el área principal del yacimiento Yuralpa y, en cambio, se centró en el posterior desarrollo del área limítrofe, donde el espesor de la columna de petróleo era inferior a 90 pies[321].

287. Sin embargo, las pruebas del Sr. Crick demostraban que el Consorcio habría dejado de lado las conclusiones y recomendaciones de este estudio exhaustivo y, en cambio, se habría dedicado a una campaña espontánea de perforación de 24 pozos verticales, comenzando con 21 pozos intercalados en el área principal del yacimiento. La justificación del Sr. Crick fue porque quería perforar pozos verticales[322].

288. El programa de perforación intercalada exhaustiva del Sr. Crick se basó en el supuesto de que la conificación de agua fue un acontecimiento general en Yuralpa[323]. Conforme la opinión de Ecuador, no había ningún documento en el expediente que respaldara esto y la perforación intercalada no era coherente con las recomendaciones del Estudio de Yuralpa. RPS demostró que, en línea con el informe de Kerr McGee[324], el movimiento del agua era mucho más complejo en el reservorio Hollín Principal. Tal como se demuestra en las simulaciones de muestras de 4 pozos de RPS, cada uno de los pozos perforados generó un amplio movimiento lateral de agua, que se extendió hacia afuera con el tiempo y, al interactuar con el movimiento del agua proveniente de los pozos contiguos, eliminó cualquier otro objetivo de perforación “intercalada”.

289. Ni el Sr. Crick ni el Dr. Strickland presentaron críticas sustanciales en contra de las simulaciones que realizó RPS o su conclusión final. El Dr. Strickland no rechazó inmediatamente la noción de amplio movimiento lateral de agua. En cambio, procuró minimizar su impacto al intentar demostrar que, incluso en el modelo de ingreso de agua

321 Resp. Rep. PHB Q., párr. 69.

322 Resp. Rep. PHB Q., párr. 68; Tr. Q. (3) 608:20-609:6 (Crick).

323 Tr. Q. (3) 618:7-13 (Crick).

324 Crick WS III, Apéndice G, pág. 15.

de 4 pozos de RPS, quedaba suficiente petróleo atrapado entre los pozos como para que se justifique perforar el quinto pozo "intercalado". Esto fracasó por dos razones:

1. Dr. Strickland se centró en representaciones de la muestra de 4 pozos en 12, 19 y 25 meses de producción. Sin embargo, esto ignoraba el hecho de que los pozos reales de Yuralpa eran mucho más antiguos. En promedio, los pozos en esta área habrían estado produciendo entre 33 y 57 meses desde el comienzo hasta el final de la campaña de perforación del Sr. Crick. Estos pozos habrían dado lugar a un movimiento de agua mucho más amplio y habrían dejado mucho menos petróleo extraíble entre ellos.

2. La recuperación de ese petróleo creciente iría acompañada de la producción de grandes cantidades de agua[325]. La producción total de agua de esos 24 pozos superaría rápidamente la capacidad operativa de 45.000 bwpd del yacimiento en 2008, lo que requeriría una importante inversión en mejoras. El Dr. Strickland no intentó cuantificar la producción de agua relacionada[326].

290. El plan de desarrollo del Sr. Crick y su propia utilización del modelo de Yuralpa produjeron mucha más agua que su supuesta capacidad operativa mejorada de 120.000 bwpd. En particular, según el plan de desarrollo del Sr. Crick, se esperaba que la producción de agua aumentara, de manera constante, a 180.000 bwpd en 2021. Como solución ante dicho aumento, el Sr. Crick contempló realizar tres *workovers* (reacondicionamientos) de cierre de agua (*WSO*) por año, a partir de 2015. Sin embargo, tal como demuestra RPS, dichos WSO no lograron la reducción masiva de la producción de agua que se esperaba[327]. Además, la propia utilización del modelo de Yuralpa por parte del Sr. Crick también arrojó cifras de producción de agua mucho más altas que sus 120.000 bwpd indicados, que después trató de limitar a través de más de 100 WSO automáticos. Tal como demostrara RPS y admitiera el Sr. Crick, sin embargo, tales operaciones eran poco realistas y costosas.

291. RPS también discrepó con la observación del Sr. Crick de que el simulador predijo en exceso la producción de agua. Esto era cierto si las operaciones en el yacimiento hubieran permanecido inalteradas, pero no es una hipótesis válida si se ponen en funcionamiento 24

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325 Tr. Q. (4) 1075:21-1077:8 (RPS).

326 Resp. PHB Q., párr. 100.

327 RPS ER V, párrs. 213-216.

pozos nuevos en el reservorio y cambia sustancialmente la forma en que operan tales pozos. Esto implicaba que un recorte proporcional razonable en la producción de líquido inevitablemente requeriría una importante reducción en la cantidad total de petróleo producido, algo que el Sr. Crick ignoró[328]. Además, en respuesta al argumento de Perenco de que, dado que "el modelo no contiene barreras de esquisto que bloquean el agua por debajo de los pozos de relleno simulados", RPS estuvo utilizando una herramienta de previsión basada en "el peor de los casos"[329], no es posible predecir con exactitud la ubicación del esquisto[330]. Esto quería decir que era poco probable encontrarse con esquisto al perforarse los 24 pozos nuevos del Sr. Crick. Si bien se podía suponer la presencia de esquisto antes de cualquier perforación, no es cierto que habrían afectado a la producción y agua acumulada. Ecuador afirmó que dicho esquisto, en el mejor de los casos, habría desviado lateralmente el curso (de lo contrario) vertical del agua[331], lo que aumentaría el caudal de agua móvil en el yacimiento y, como consecuencia, la cantidad de agua producida por otro pozo[332].

292. RPS también señaló que, además de no establecer un límite en el yacimiento sobre la producción total de agua, el Sr. Crick modificó la manera en que la simulación controla los pozos al cambiar, al mismo tiempo, las tasas mínimas de producción de los pozos y los procedimientos de los *workovers*, "todo ello de un modo que tiende a aumentar la producción de petróleo"[333]. RPS concluyó que esto era "extremadamente optimista"[334].

293. Ecuador también criticó la metodología de proyección de curvas tipo del Sr. Crick[335] al afirmar que puede ser muy impreciso, que difiere de la realidad hasta en un 45%, tal como

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328 *Ibid.*, párr. 208.

329 Cl. PHB Q., párr. 44.

330 Tr. Q. (4) 1001:2-7, 1021:12-17 (Strickland); Tr. Q. (3) 618:16-18 (Crick).

331 Resp. Rep. PHB Q., párr. 71, en referencia a Strickland ER I, Figuras 1 y 5; Tr. Q. (3) 618:18-20 (Crick).

332 Resp. Rep. PHB Q., párr. 71.

333 RPS ER V, párr. 209. [Traducción del Tribunal]

334 *Id*. [Traducción del Tribunal]

335 Resp. PHB Q., párr. 118: en primer lugar, el Sr. Crick determina la tasa inicial de petróleo para sus pozos nuevos, antes de aplicarles una proyección de curva tipo a estos últimos (y a los pozos existentes) a nivel del

reconoció el Sr. Crick[336]. La tasa inicial de los pozos se determinó incorrectamente; el Sr. Crick pretendió derivar esta tasa de una supuesta corrección entre las tasas iniciales reales de 27 pozos de Perenco y 11 pozos perforados por Petroamazonas; sin embargo, el Sr. Crick admitió en la Audiencia sobre *Quantum* que esta no era una corrección confiable[337]: su coeficiente de 0,25 era muy inferior al 0,6 requerido para encontrar una correlación estadística válida. Además, la información de los pozos en la que se basó el Sr. Crick para derivar esta "falta de correlación" se seleccionó de manera incongruente porque eligió excluir ocho pozos de un total de 35 (23% de la información disponible) sobre la base de que él los consideró "atípicos"[338]. Tal como fuera señalado por RPS, es estadísticamente incorrecto excluir el 23% de los datos[339].

294. El intento del Sr. Crick de validar su método por referencia a "la tasa inicial de los pozos de Petroamazonas para predecir el rendimiento de los pozos de Petroamazonas" es claramente infructuoso, ya que se basa en un proceso circular (y, por lo tanto, técnicamente incorrecto).

295. A pesar de ser "fácilmente reconocida" como defectuosa[340], Perenco pretendió volver a caracterizar la correlación de tasa inicial del Sr. Crick como una base útil y moderada para la proyección, pero Ecuador argumentó que encontraba fundamento en declaraciones que el Sr. Crick en realidad no realizó en la Audiencia sobre *Quantum*[341].

296. RPS estimó que la producción acumulada de petróleo del Bloque 21 habría alcanzado un total de 29,64 MMbo hasta el vencimiento del contrato. Dicha producción se habría

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campo. Tr. Q. (3) 613:5-12 y Tr. Q. (3) 619:8-12 (Crick). *Véase también* Crick WS II, párrs. 113-115 y 183-188.

336 Tr. Q. (3) 635:20-637:20 (Crick).

337 Tr. Q. (3) 636:13-15, 638:10-640:5 (Crick). *Véase también* Presentación Directa de RPS, pág. 11; RPS ER V, párrs. 175 y 176.

338 Resp. PHB Q., párr. 119. [Traducción del Tribunal]

339 Resp. PHB Q., párr. 119, en referencia a Tr. Q. (4) 1080:4-19 (RPS). *Véase también* RPS ER V, párrs. 173-177.

340 Resp. Rep. PHB Q., párr. 80, en referencia a Cl. PHB Q., párr. 50; Tr. Q. (3) 639:17-22 (Crick).

341 Resp. Rep. PHB Q., párr. 80, en referencia a Cl. PHB Q., párr. 50; Tr. Q. (3) 620:1-10, 639:17-22 (Crick).

derivado de los pozos existentes (22.83 MMbo) y de los seis pozos nuevos que el Consorcio habría perforado, de no haber sido por la promulgación del Decreto 662 (6,81 MMbo)[342]. La proyección de RPS se derivó del modelo de simulación de Yuralpa, que representaba la culminación de una etapa importante del trabajo de simulación y geomodelado llevado a cabo por el propio departamento de geociencia de Perenco. Tal modelo era, sin duda, la mejor y más actualizada herramienta de proyección disponible para el Consorcio desde finales de 2007 en adelante y, por consiguiente, el medio más apropiado para la proyección de la producción de petróleo en el Bloque 21[343].

(iii) La Decisión del Tribunal

297. El Tribunal señala que para el Bloque 21, el plan del Sr. Crick era que los 24 pozos del yacimiento Yuralpa se perforarían en el período que comenzaba en enero de 2008 hasta finales de 2009 (en el supuesto de dos plataformas operativas, cada una de las cuales requiere un mes para la perforación del pozo)[344] y no proyectó ninguna perforación adicional desde el final de 2009 hasta la extinción del contrato en 2021, período de aproximadamente 11 años. En su tercera declaración testimonial, ajustó su fecha de comienzo a julio de 2008[345]. No obstante, aun así contempló los 24 pozos que se perforaron con anticipación de la declaración de caducidad y ninguno de los perforados tras ello.

298. Su programa de perforación 'contrafáctico' se encontraba en la 'etapa inicial'.

299. El Tribunal ha tomado nota de pruebas documentales y orales que demuestran que:

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342 RPS ER IV, párr. 150, Tabla 14.

343 Si bien Perenco buscó describir la confianza depositada por RPS en la versión actualizada de 2010 de este modelo como incongruente debido a su enfoque *ex ante*, la realidad es que RPS no recibió la versión de junio de 2008 del modelo. Las implicaciones del uso de RPS de la actualización de 2010 serían, en cualquier caso, intrascendentes a la luz del propio testimonio de Crick de que lo que sucedió en 2010 fue un ajuste menor típico del modelo y no una actualización completa que incorpore todo el conocimiento disponible al momento. *Véase* Crick WS III, párrs. 53 y 54.

344 Crick WS II, párr. 256. Perenco empleó dicho programa a partir de diciembre de 2004, momento en el que perforó 28 pozos hasta que detuvo la perforación para realizar un estudio de campo. RPS ER V, párr. 143.

345 Crick WS III, párr. 3.

(1) El Bloque 21 presentó un desempeño consistente por debajo de las expectativas después de los primeros tres meses de producción en 2004[346];

(2) Esto resultó en la decisión de Perenco de detener la perforación en febrero de 2007, unos siete meses antes de que el Decreto 662 entrara en vigor[347];

(3) La empresa matriz de Burlington, ConocoPhillips, presentó una Revisión de Reservas de América Latina en mayo de 2007 la cual señalaba que la perforación en Yuralpa se encontraba "*actualmente detenida con el fin de realizar un estudio de campo (tema clave de producción de agua)*" y que "*los resultados decepcionantes de la última parte del 2006 redujeron las oportunidades de desarrollo de la [perforación]* - Estudio de campo actualmente en curso"[348].

(4) El Memorándum Informativo de ConocoPhillips (también de mayo de 2007) establecía que "... debido a un surgimiento hídrico previo a lo esperado en los últimos pozos, la perforación subsiguiente se ha suspendido hasta que se complete un estudio de yacimientos y de prácticas de terminación"[349].

(5) Con base en el estudio preliminar realizado por Perenco, ConocoPhillips en este punto anticipó nueve pozos como "potenciales objetivos" (cuatro ubicaciones de relleno y cinco de compensación (es decir, flancos), pero para la Reunión del Comité de Presupuesto de septiembre de 2007 (en adelante, BCM), la cantidad se redujo a entre cinco y siete, con menos pozos interiores[350].

(6) Perenco informó a la BCM del 26 al 27 de septiembre de 2007 que no se realizaría "*ninguna inversión [en el Bloque 21] ... Durante el primer semestre de 2008*"[351].

(7) El "programa preliminar" de Perenco de septiembre de 2007 consistió en perforar entre cinco y siete pozos.

(8) El informe definitivo sobre el estudio de campo se distribuyó recién en junio de 2008, ocho meses después de que el Decreto 662 entrara en vigor[352].

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346 Tr. Q. (2) 382:14-386:12 (Combe); Tr. Q. (2) 388:20-391:5.

347 Tr. Q. (4) 1029:13-1030:2 (Strickland). E-393, *ConocoPhillips Latin America Reserves Review Ecuador*, 7 de mayo de 2007, pág. 13; E-275, Memorando Confidencial, ConocoPhillips, mayo de 2007, pág. 44.

348 RPS ER IV, Apéndice K, págs. 5 y 13. RPS afirmó que esto demuestra que el Consorcio consideraba a este programa de perforación como una "última oportunidad" de éxito. *Véase* RPS ER V, párr. 164. [Traducción del Tribunal]

349 E-275, Memorando Informativo de ConocoPhillips. [Traducción del Tribunal]

350 RPS ER IV, Apéndice H, pág. 164.

351 E-387, Diapositivas de la Reunión del Comité de Presupuesto, Diapositiva 164. [Traducción del Tribunal]

352 RPS ER V, párr. 161

(9) RPS admite que el estudio de campo identificó dos áreas no barridas en el Bloque 21 donde el petróleo no habría sido drenado por los pozos existentes[353].

300. Las verdaderas preguntas para el Tribunal son: (i) dada la historia del yacimiento de Yuralpa, a qué ritmo se habría producido la perforación en el escenario 'contrafáctico'; y (ii) cuál sería el impacto financiero del manejo del agua requerido para explotar los pozos de Yuralpa.

301. RPS destacó los siguientes puntos sobre el estudio de simulación de Perenco:

> "Las reservas de caja básicas fueron 20,3 MMStb. Se calcularon utilizando los pozos que existían a octubre de 2007 y utilizando las tasas de producción de fluidos de ese momento.
>
> La capacidad de manejo de agua fue de 45.000 barriles por día.
>
> Perenco evaluó el potencial para aumentar las reservas a 25,7 MMStb manteniendo la reducción actual en los pozos existentes. Esto requeriría un aumento en el manejo del agua a 60.000 barriles por día.
>
> [...]
>
> Perenco evaluó la perforación de entre cinco y siete pozos, lo que podría aumentar las reservas a 32,0 MMStb con las tasas actuales de producción de líquido en los pozos existentes"[354].

302. Sobre la base de las pruebas ante sí, el Tribunal considera que, durante el período 'contrafáctico' posterior al 4 de octubre de 2007, el Consorcio habría sido, por una parte, incentivado a perforar debido al aumento de los precios del petróleo experimentado durante el período anterior a octubre de 2007. Por otro lado, el Consorcio habría sido más conservador que el Sr. Crick al comprometerse con un ambicioso programa de perforación, al considerar el hasta entonces decepcionante desempeño del Bloque 21. Dicho esto, la

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353 RPS ER V, párr. 54: "Asimismo, en pos de reflejar adecuadamente la perspectiva del Consorcio, RPS adoptó el modelo desarrollado por los colegas de Perenco del Sr. Crick, según lo mencionado por Perenco el 19 de diciembre de 2014 en el Primer Informe del Dr. Strickland. RPS procedió a utilizar este modelo de manera diligente y prudente para investigar la solidez de los hallazgos del equipo de simulación de Perenco con respecto a las dos áreas potencialmente no barridas del reservorio Hollín Principal en Yuralpa y su recomendación de perforar entre 5 y 7 pozos para explotar la oportunidad de recuperar los volúmenes encontrados allí dentro". [Notas al pie omitidas] [Traducción del Tribunal]

354 RPS ER V, párr. 151. [Traducción del Tribunal]

opinión general debe ser que en el mundo 'contrafáctico', particularmente ante un período de tiempo relativamente extenso establecido en el Contrato y los precios del petróleo fuertes en ese momento, el Consorcio habría perforado todos los pozos que fueran factibles desde el punto de vista técnico y económico.

303. Dadas las circunstancias, y con fundamento en el ajuste temporal del Sr. Crick, el Tribunal considera que dicho programa no habría comenzado antes de julio de 2008[355]. Por lo tanto, al estimar el valor del yacimiento de Yuralpa a los efectos de calcular el impacto del Decreto 662, no existiría un aumento en la cantidad de pozos del Bloque 21 hasta mediados de 2008. Respecto de lo que ocurriría a partir de entonces, el Tribunal considera que sería apropiado suponer que Perenco habría perforado seis pozos entre el Decreto 662 y la declaración de caducidad.

304. El Tribunal considera que el punto de partida para el análisis es un modelo basado en el programa de perforación contemplado en 2008 (seis pozos) durante el período previo a la caducidad y ajustarlo a una mayor cantidad de pozos.

E. El impacto de la terminación de la caducidad del saldo de los derechos contractuales de Perenco

305. La declaración de caducidad dio por extinguidos los Contratos de Participación. Esto ocurrió solo un mes antes de que el Contrato de Participación del Bloque 7 expirara. Como ya fuera señalado, el Tribunal se ha negado a asumir un modelo contractual particular que podría haber regido la relación de las Partes en relación con el Bloque 7, y ha optado por considerarlo como una pérdida de oportunidad resarcible, que se procederá a analizar *infra*.

306. Por lo tanto, el Tribunal comienza a examinar la situación en el Bloque 21, el cual Perenco habría operado durante aproximadamente 11 años si no se hubiera declarado la caducidad. Esto trae a colación el plan de perforación 'contrafáctico' del Sr. Crick para el yacimiento Yuralpa.

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355 Inicialmente, el Sr. Crick utilizó como fecha de inicio enero de 2008, pero luego la ajustó a julio de 2008, lo que redujo sus volúmenes de petróleo previstos en un 2%. *Véase* Crick WS III, párr. 3.

307. Con respecto a los 11 años restantes del Contrato y los precios imperantes en el período anterior a julio de 2010, si no se hubiera declarado la caducidad, dado que existe petróleo explotable en el Bloque 21, el Tribunal considera que Perenco habría realizado perforaciones adicionales, particularmente cuando se entiende que el Tribunal ha decidido asumir que, a partir de octubre de 2008, los Contratos de Participación se estabilizarían en un 33%. En última instancia, el Tribunal ha decidido emplear una cantidad de pozos del escenario del Sr. Crick en un rango medio. En opinión del Tribunal, teniendo en cuenta las prácticas de la industria y, en particular, la conveniencia de maximizar los rendimientos de Perenco en el Bloque 21 durante un largo período de tiempo, así como el valor de acelerar la perforación para capturar la mayor producción posible, pero teniendo en cuenta la historia del Bloque relativa a los problemas de filtración de agua, Perenco habría perforado pozos adicionales luego de la expropiación.

308. Al haber alcanzado esta conclusión, el Tribunal es consciente del hecho de que el tribunal del caso Burlington adoptó una posición diferente, es decir, que teniendo en cuenta la situación existente hasta septiembre de 2007 antes de la promulgación del Decreto 662, solo se había programado la perforación de seis pozos. Esta era la cantidad de pozos que ese tribunal consideraba razonable de suponer dadas las circunstancias. El presente Tribunal no puede estar de acuerdo con la fuerte confianza depositada en el caso *Burlington* sobre la Presentación de BCM de septiembre de 2007 y acepta el argumento de Perenco de que "las presentaciones del comité de presupuesto no son planes de desarrollo y que Perenco no tenía la intención, durante el transcurso de una única reunión presupuestaria en 2007, de plantear sus planes para los 14 años restantes del Contrato del Bloque 21"[356]. El Tribunal considera que, dado el plazo previsto de 14 años, el Consorcio probablemente habría perforado más pozos siempre que considerara que existía petróleo comercialmente extraíble[357].

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356 *Véanse* Comentarios de Perenco de fecha 18 de abril de 2017 sobre el Laudo *Burlington*, pág. 4. [Traducción del Tribunal]

357 Laudo *Burlington*, párrs. 425-426, 436 y 449.

309. Saber que Petroamazonas ha validado en cierta medida el modelo del Sr. Crick relativo a la capacidad productiva de los Bloques es de cierta ayuda para que el Tribunal advierta que ha realizado una valuación justa y razonable; no obstante, en última instancia, el enfoque del Tribunal debe: (i) aplicar las condiciones de mercado vigentes al momento de la toma de control; (ii) adoptar el enfoque comercial de sentido común relativo a que, con 11 años restantes en la vida útil del Bloque 21, Perenco probablemente habría buscado maximizar sus esfuerzos para extraer tanto valor del Bloque como fuera razonablemente posible; (iii) el programa de perforación de Perenco se habría llevado a cabo de una manera más conservadora que la establecida en el plan del Sr. Crick, pero aun así habría tratado de superar los desafíos técnicos del yacimiento de Yuralpa; y (iv) a medida que Perenco adquiría más conocimiento y experiencia del yacimiento, habría utilizado ese conocimiento y experiencia para obtener un beneficio comercial en sus decisiones de perforación.

310. El Tribunal considera que 'de no haber sido por' la declaración de caducidad, Perenco habría perforado diez pozos (además de los seis pozos perforados con anticipación a la caducidad) en el período comprendido entre los años 2010 y 2020.

311. Tras analizar la evidencia presente en el expediente y los argumentos de las Partes, el Tribunal concluye, asimismo, que los niveles de producción de agua asociados con un programa de perforación de 16 pozos serían de 120.000 bwpd[358].

F. Valuación de la pérdida de oportunidad de Perenco para operar el Bloque 7

312. El Tribunal procede a abordar ahora la valuación de la pérdida de oportunidad de negociar un acuerdo para continuar operando el Bloque 7 hasta agosto de 2018. Como se analizara anteriormente, este ejercicio difiere de la valuación del lucro cesante o las ganancias esperadas en virtud de un contrato celebrado y el interrogante se refiere a cómo valorar dicha oportunidad.

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358 *Véase* Sección II.I(6) *infra* respecto del CAPEX.

1. Posición de Perenco

313. Perenco afirmó (en subsidio de su reclamación sostenida de USD 626 millones basada en el contrato AGIP, que el Tribunal ya ha rechazado) que Ecuador debe pagar daños y perjuicios por el valor de la oportunidad perdida de Perenco de obtener una prórroga del contrato y beneficiarse de ella. Los tribunales están dispuestos a aplicar la doctrina de la pérdida de chance incluso en los casos en que la probabilidad es baja. En el presente caso, Perenco estableció que muy probablemente se habría otorgado una prórroga y que, como mínimo, debería recibir una indemnización por la pérdida de oportunidad de operar en el Bloque 7 hasta 2018. El caso de Perenco fue diferente al de los demandantes del caso *Gemplus*, en el cual los demandantes basaron su reclamación de prórroga exclusivamente sobre el hecho de que la concesión generó una expectativa legítima de que se podrían esperar ingresos adicionales significativos a partir del segundo período de 10 años[359]. Perenco había establecido una fuerte base fáctica para la prórroga y ello no constituía una reclamación por daños especulativos e inciertos.

1. Posición de Ecuador

314. Por el contrario, Ecuador se basó en el Laudo del caso *Gemplus*, en el que el tribunal examinó el lenguaje de una cláusula redactada de forma similar y concluyó que, si bien el ejercicio de la discreción del Estado no era irrestricto conforme al derecho local, la reclamación de la demandante respecto del segundo período de diez años era demasiado contingente, incierta e infundada, y carecía de base fáctica suficiente para la evaluación de la indemnización en virtud de los dos TBI aplicables. En la fecha relevante, el concesionario no tenía derecho legal a ninguna prórroga[360]. Del mismo modo, si bien la discrecionalidad de Ecuador no era absoluta de conformidad con el derecho ecuatoriano, la reclamación de Perenco por una prórroga de ocho años era demasiado contingente, incierta e infundada, y carecía de una base fáctica suficiente para la evaluación de la indemnización

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359 *Gemplus c. México*.

360 Laudo *Gemplus c. México*, párrs. 12-49.

en virtud del Tratado. A la fecha de caducidad, a Perenco no le asistía derecho legal a una prórroga[361].

2. La Decisión del Tribunal

315. Las partes han discurrido sobre la relevancia del laudo del caso *Gemplus*, en el cual el contrato de concesión en cuestión contenía una cláusula que contemplaba una prórroga del plazo inicial de 10 años. La razón principal por la cual dicho tribunal rechazó la reclamación de pérdida de oportunidad basada en la posible renovación del contrato derivó del hecho de que las circunstancias que inicialmente desordenaron el proyecto de registro de vehículos motorizados y obligaron a las autoridades a intervenir para administrar el concesionario ocurrieron en el propio inicio de la vida de la Concesión[362]. Esto provocó una disminución comprensible de la confianza pública en la iniciativa de registro[363]. Por lo tanto, el tribunal enfrentó pocas dificultades a la hora de rechazar esa parte de la reclamación.

316. No obstante, si bien se enfrentaba a circunstancias fácticas radicalmente diferentes a las del presente caso, e intentaba realizar la valuación de una pérdida resultante de derechos contractuales existentes, el tribunal de Gemplus destacó dos puntos sobre la 'pérdida de oportunidad' que resuenan en el presente Tribunal. En primer lugar, no había "certeza o

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361 Resp. Rep. PHB Q., párr. 15.

362 Los hechos en cuestión se centraron en el arresto del gerente general de la concesionaria, Ricardo Cavallo, por su presunto papel en la "guerra sucia" argentina, su detención en México y la posterior extradición a España a petición de un juez de instrucción español, y su posterior extradición a Argentina para enfrentar acusaciones por crímenes de guerra en ese país. El arresto del Sr. Cavallo fue seguido rápidamente por la muerte en circunstancias turbias de un alto funcionario del gobierno, el Dr. Raúl Ramos, responsable del proyecto de registro de vehículos automotores.

363 Laudo *Gemplus c. México,* 13-96 "Según lo determinó este Tribunal, [al momento de la terminación] el proyecto ya estaba, en ese momento, muy perjudicado por hechos anteriores de los cuales la Demandada no era responsable bajo los TBI, y continuó sujeto a varios riesgos comerciales, legales y políticos. Además, en septiembre de 2000, fueron los propios esfuerzos de la Demandada los que mantuvieron el proyecto en funcionamiento a medias (es decir, sólo para vehículos nuevos) y los que evitaron que se destruyera completamente por los dos infortunios de agosto/septiembre de 2000, es decir, el incidente de Cavallo y el fallecimiento del Dr. Ramos. Si no hubiera sido por los esfuerzos del Dr. Blanco en ese momento (en la Secretaría), la Concesionaria habría fracasado en septiembre de 2000 o poco tiempo después. Asimismo, este proyecto a medias, al 24 de junio de 2001, estaba lejos del proyecto originalmente concebido que dependía de la inscripción tanto de vehículos nuevos como usados".

expectativa realista de rentabilidad de este proyecto como se lo había concebido originalmente, pero sí había, sin embargo, una oportunidad razonable" y esa "oportunidad, aunque pequeña, tiene un valor monetario" en el derecho internacional[364]. En segundo lugar, "sería en principio incorrecto privar a las Demandantes del valor monetario de su oportunidad perdida u oportunidad perdida disminuir dicho valor debido a la falta de pruebas cuando son los ilícitos de la propia Demandada los que causan dicha falta"[365].

317. Esto se encuentra en consonancia con la opinión del presente Tribunal. Los hechos son los siguientes: (i) El Bloque 7 era un yacimiento probado con valiosas reservas de petróleo; (ii) no existe duda de que, incluso con un modelo contractual modificado, Perenco deseaba permanecer en Ecuador y seguir operando el bloque; y (iii) existen pruebas considerables de que el propio Estado habría preferido que Perenco permaneciera en Ecuador. El Tribunal cree que 'de no haber sido por' las violaciones, las partes probablemente habrían llegado a una solución mediante la cual Perenco estaría operando el Bloque 7 en virtud de un régimen contractual diferente. Sin embargo, el Tribunal también ha determinado que no puede participar en una especie de especulación sobre un modelo contractual específico que luego se emparejaría con las proyecciones del Sr. Crick en aras de llegar a un monto de indemnización por daños y perjuicios.

318. Perenco refirió al Tribunal a la obra de Ripinsky y Williams sobre Indemnizaciones por Daños y Perjuicios en el Derecho Internacional de Inversiones, en la que los autores observaron que:

> "La pérdida de chance puede entonces utilizarse como una herramienta que permite a la parte damnificada recibir alguna forma de indemnización por la pérdida de oportunidad de obtener ganancias. En teoría, la pérdida de chance se evalúa por referencia al grado de probabilidad de que la oportunidad se resuelva a favor de la demandante, aunque en la práctica el monto otorgado por dicho concepto es a menudo discrecional"[366].

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364 *Ibid.*, párrs. 13-98.

365 *Ibid.*, párrs. 13-99.

366 CA-511, Ripinsky, Sergey & Williams, Kevin, Daños y Perjuicios en el Derecho Internacional de Inversiones [*Damages in International Investment Law*] (Londres: Instituto Británico de Derecho Internacional y Comparado, 2008), págs. 291 y 292. [Traducción del Tribunal]

319. Los autores continúan:

> "En algunos otros casos, los tribunales arbitrales han determinado el monto del lucro cesante de manera discrecional. En los casos en que dicha falta de apoyo numérico se debió al hecho de que un tribunal no pudo estimar el lucro cesante con precisión satisfactoria, dichos laudos podrán clasificarse como indemnización por la pérdida de oportunidades comerciales. Es probable que los montos concedidos bajo este rubro indemnizatorio sean conservadores y reflejen la opinión del tribunal de un resultado equitativo, razonable y equilibrado en lugar de ser el resultado de un cálculo matemático"[367].

320. El Tribunal observa que la reclamación de este caso no debe equipararse a una reclamación por lucro cesante basada en un contrato final ejecutado. Existe un elemento de incertidumbre que debe tenerse en cuenta.

321. Para arribar a esta decisión, el Tribunal ha analizado los Artículos de la CDI, en particular el Artículo 36, y los comentarios (específicamente, los incisos (27) y (32)). El Artículo 36 establece que:

> "1. El Estado responsable de un hecho internacionalmente ilícito está obligado a indemnizar el daño causado por ese hecho en la medida en que dicho daño no sea reparado por la restitución.
>
> 2. La indemnización cubrirá todo daño susceptible de evaluación financiera, incluido el lucro cesante en la medida en que esté sea comprobado."[368].

322. El punto clave es que el daño financiero no solo debe ser causado inmediatamente por el(los) acto(s) ilícito(s), sino que también debe ser "*estimable*", es decir, pasible de ser estimado. El Tribunal ya ha mencionado que también resulta aplicable a la cita de casos y comentarios que las cortes, los tribunales y las comisiones de reclamaciones internacionales intentan evitar el otorgamiento de "reclamaciones intrínsecamente especulativas" o, para decirlo de otro modo, pretenden determinar si existen "atributos

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367 *Ibid*., pág. 293. [Traducción del Tribunal]

368 *Artículos de la CDI.*

suficientes para ser considerado un interés legalmente protegido con la suficiente certeza como para ser resarcible"[369].

323. Las circunstancias del presente caso son inusuales. Las partes llegaron a una modificación 'en principio' negociada de su relación contractual, la cual contemplaba la prórroga del plazo del Bloque 7. Sin embargo, fue Ecuador, y no Perenco, quien se opuso a la implementación debido a la obstinación de Burlington. El Tribunal consideró que dicha negativa constituía una violación del Tratado por parte de Ecuador, la cual privó a Perenco de la posibilidad de llegar a un acuerdo sobre la prórroga[370]. Por consiguiente, el Tribunal considera que Perenco tiene derecho a una indemnización por la pérdida de esa oportunidad.

324. El Tribunal reconoce francamente que cualquier estimación del valor de la pérdida de oportunidad constituye un ejercicio discrecional y, en consecuencia, ha decidido conceder un valor nominal. En tal sentido, el Tribunal recuerda un comentario hecho por el tribunal del caso *Murphy c. Ecuador* con el cual el Tribunal coincide:

> "…El estándar de derecho internacional aplicable de reparación plena, tal como se refleja en la sentencia (*sic*) del caso *Chorzów Factory* y en el Artículo 31 de los Artículos de la ILC (sic) sobre Responsabilidad del Estado, no determina la metodología de valuación. Tampoco lo hace el Tratado. Los tribunales disfrutan de un amplio margen de apreciación en aras de determinar cómo una cantidad de dinero puede "en la medida de lo posible, debe eliminar todas las consecuencias del acto ilegal y restablecer la situación que, muy probablemente, habría existido si dicho acto no se hubiera cometido"[371].

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369 *Ibid* Comentario (27) al Artículo 34. En particular, la preocupación expresada sobre la necesidad de garantizar que exista un daño "evaluable financieramente": "los tribunales se han mostrado reacios a conceder una indemnización por reclamaciones con elementos de naturaleza especulativa. Cuando se las compara con activos tangibles, las ganancias (y los activos intangibles que están basados en los ingresos) son relativamente vulnerables a los riesgos comerciales y políticos, y más aun a medida que se incrementan los plazos de las proyecciones futuras. Los casos en los que se han otorgado ganancias futuras perdidas han sido aquellos en los que un flujo de ingresos anticipado alcanzó atributos suficientes para ser considerado un interés legalmente protegido de suficiente certeza para ser resarcible. Normalmente, ello se ha logrado debido a acuerdos contractuales o, en algunos casos, a una historia comercial bien establecida". [Traducción del Tribunal]

370 Decisión sobre Responsabilidad, párrs. 622-624

371 *Murphy c. Ecuador*, párr. 481.

325. Debido a que resulta una pérdida de oportunidad relativa a la prórroga del contrato en lugar de la pérdida de un derecho legal totalmente cristalizado relativo a una prórroga de un contrato cuyos flujos esperados de efectivo podrían modelarse en base al FCD, dicho valor necesariamente debe ser significativamente menor que la suma reclamada por Perenco en base al modelo de contrato AGIP aplicado por las proyecciones de perforación del Sr. Crick para el Bloque 7 hasta el 2018.

326. En todas las circunstancias, el Tribunal sostiene que un laudo de USD 25 millones es apropiado. Cabe destacar que los valores de equidad tienden fuertemente a favor de la concesión de este resarcimiento. Sin embargo, no se trata de una decisión *ex aequo et bono*. Posee fundamento legal.

G. Culpa concurrente

327. Los planteos de defensa de Ecuador en materia de responsabilidad y *quantum* propugnaron numerosos argumentos en el sentido de que Perenco era el autor de su propia desgracia o había contribuido al daño respecto del cual ahora solicita una indemnización por daños y perjuicios. Esta noción fue predominante en el argumento que Ecuador sostuvo durante la etapa de responsabilidad relativo a que Perenco y Burlington llevaron a cabo una estrategia de "*autoexpropiación*" al negarse a cumplir con la Ley 42 mediante el pago de valores en una cuenta *offshore* y al entender que sería mejor mantener dicho dinero y no operar los Bloques[372]. En la etapa de determinación de daños, Ecuador argumentó de manera similar que Perenco contribuyó a la controversia relativa a las acciones coactivas al negarse a pagar las deudas en virtud de la Ley 42, al amenazar con demandar a las personas que compraron el petróleo en una subasta y al suspender las operaciones, sabiendo que esto forzaría al Estado a intervenir y, en última instancia, que podría ser una causal de caducidad[373].

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372 Resp. C-Mem. M., párr. 599; Resp. Rej. M., párrs. 16 y 290-296. [Traducción del Tribunal]

373 Resp. Rej. Q., párrs. 507-512 y 523-525.

1. Posición de Ecuador

328. Por lo tanto, Ecuador argumentó que, si es que Perenco tenía derecho a una indemnización por daños y perjuicios, esta última debería reducirse por culpa concurrente. Adujo que el derecho internacional es claro en cuanto a que la negligencia simple (si se demuestra la falta del debido cuidado de los bienes o los derechos propios)[374] que contribuye concurrentemente con una pérdida es suficiente para establecer la existencia de culpa concurrente[375].

329. En su opinión, la negativa de Perenco a pagar los montos adeudados en virtud de la Ley 42 fue inherentemente negligente porque obligó a Ecuador a reaccionar. Ecuador sostuvo que sus propias presuntas infracciones del derecho internacional eran irrelevantes a los fines de la culpa concurrente de Perenco porque la doctrina de la culpa concurrente existe a fin de reducir la indemnización por daños y perjuicios resultante de la violación de la demandada debido a la propia contribución negligente de la demandante a la pérdida que ha sufrido. Ecuador sostuvo que si se aceptara la excusa de Perenco respecto de lo que Ecuador llamó "evasión fiscal"[376] (es decir, la respuesta de Ecuador fue contraria a sus derechos internacionales), la doctrina de la culpa concurrente no tendría ninguna aplicación posible. Ecuador se basó en tal sentido en los laudos de los casos *Goetz*, *Occidental* y *Yukos*, en los cuales los tribunales constataron que los demandantes cometieron una culpa concurrente al instigar la violación del Estado y, por lo tanto, la indemnización por daños y perjuicios que se otorgó se vio disminuida[377].

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374 CA-193-L, *Artículos Sobre Responsabilidad del Estado por Hechos Internatcionalmente Ilícitos*, 2001, Art. 39, comentario 5. ("***Artículos de la CDI***")

375 Resp. Rep. PHB Q., párr. 105.

376 Resp. PHB Q., párr. 167.

377 Resp. PHB Q., párr. 169, nota al pie 265, en referencia a Cl. Rep. Q., párr. 208 ("en *Goetz II*, el tribunal disminuyó la indemnización por daños y perjuicios otorgada a los demandantes sobre la base de que los demandantes no habían cumplido con la regulación cambiaria aplicable. [...] En *Occidental II*, el tribunal reconoció que 'puede reducirse la compensación si la parte demandante tuvo culpa y esa culpa contribuyó al perjuicio sufrido' y sostuvo que en dicho caso el inversionista 'actuó de manera negligente y que fue culpable de un acto ilícito' al no obtener la autorización ministerial previa a fin de transferir los derechos que le asistían en virtud del contrato de participación. [...] En *Yukos*, el tribunal determinó que, a diferencia de otras empresas rusas, Yukos 'violó la legislación y abusó de los regímenes de bajos impuestos ... a través de la naturaleza simulada' de sus operaciones en ciertas regiones" [Traducción del Tribunal]) (que cita *Antoine Goetz y otros*

330. Ecuador sostuvo que, asimismo, Perenco fue negligente, o incluso imprudente, al suspender las operaciones en curso en los Bloques y al hacer caso omiso de manera consciente de los riesgos de daño ambiental y pérdidas de producción. Al suspender las operaciones con poca anticipación[378], Perenco actuó con indiferencia imprudente incluso en relación con sus propios derechos, aunque previó que Ecuador se vería obligado a responder. Aun si se le permitiera a Perenco, en principio, suspender las operaciones, Perenco no podría hacerlo sin considerar los riesgos. El Sr. Perrodo admitió en repetidas ocasiones que decidió suspender las operaciones a pesar de su plena conciencia de los riesgos. Específicamente, el Sr. Perrodo aceptó que era consciente de que suspender las operaciones implicaba riesgos graves, incluidas las pérdidas de producción en los Bloques 7 y 21 y daños ambientales en la región amazónica de Ecuador[379]. Reconoció que estos riesgos obligarían a Ecuador a responder y podrían resultar en una caducidad[380]. Admitió que, al hacer caso omiso de manera consciente de estos graves riesgos, decidió suspender las operaciones en los Bloques 7 y 21[381].

331. Ecuador argumentó además que la conducta de Perenco durante las negociaciones de las Partes fue negligente y condujo a su fracaso. Había rechazado las propuestas de Ecuador, por lo cual dificultó aun más el proceso de negociación. Contrariamente a lo que alega Perenco, el Tribunal nunca determinó que Perenco estuviera justificado para dar por terminadas las negociaciones con fundamento en la "coerción ilícita de Ecuador"[382]. El hecho de que Perenco no "hiciera su mayor esfuerzo" para alcanzar la renegociación de los

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y S.A. Affinage des Metaux c. República de Burundi, Laudo, 21 de junio de 2012, ¶ 258, EL-289; *Occidental Petroleum Corporation y Occidental Exploration and Production Company c. La República del Ecuador*, Laudo, 5 de octubre de 2012, ¶¶ 678-679, CA-431; *Yukos Universal Ltd c. Rusia*, Caso CPA No. AA 227, Laudo Definitivo, 18 de julio de 2014, ¶¶ 1611 y 1615, CA-447). *Gemplus* es la excepción que confirma la regla: el tribunal rechazó la culpa concurrente solo porque era imposible que los demandantes supieran que su empleado tenía un pasado delictivo. *Gemplus S.A. c. México*, Laudo, 10 de junio de 2010, ¶ 11.14, CA-439.

378 Decisión sobre Responsabilidad, párr. 199: "El 13 de julio de 2009, Perenco y Burlington le escribieron de forma conjunta al Ministro Pinto para informar al Ecuador la intención del Consorcio de comenzar la suspensión de sus operaciones el 16 de julio de 2009".

379 Tr. Q. (2) 538:16-539:16 (Perrodo).

380 Tr. Q. (2) 544:16-545:1 (Perrodo).

381 Tr. Q. (2) 545:7-13 (Perrodo).

382 Resp. Rej. Q., párr. 519. [Traducción del Tribunal]

Contratos de Participación conforme a las Actas de Acuerdo Parcial de octubre de 2008, tras haber firmado tres acuerdos parciales durante 2008, supuso el cese "injustificado" de la negociación que dio lugar a una *culpa in contrahendo*.[383]

332. Asimismo, Ecuador alegó que Perenco no podía basarse en el argumento de que la conducta ilícita de Ecuador era la causa inmediata de la caducidad. Un único evento puede tener múltiples causas inmediatas. La doctrina de la culpa concurrente depende de esta posibilidad. La culpa concurrente reduce la indemnización exactamente en los casos en que tanto la demandada como la demandante contribuyen o causan de forma inmediata la pérdida de la demandante. El Artículo 39 de los Artículos sobre Responsabilidad del Estado versa sobre dicha situación[384]. La supuesta causalidad inmediata de Ecuador no modifica el hecho de que la negativa de Perenco a pagar los impuestos aplicables en virtud de la Ley 42 y su decisión de abandonar los yacimientos de petróleo contribuyeron directamente a la caducidad[385].

333. Finalmente, si Perenco se refirió a las acciones coactivas y la subasta de petróleo como la causa inmediata de la caducidad, la imprudente decisión de Perenco de suspender las operaciones en los Bloques fue una causa más directa de caducidad que las acciones coactivas y la subasta del petróleo[386].

2. Posición de Perenco

334. Perenco respondió que Ecuador debe asumir la carga probatoria relativa a dos elementos de su teoría de culpa concurrente. Primero, Ecuador debe demostrar que Perenco cometió un acto ilícito, ya sea de manera intencional o negligente; las malas decisiones comerciales que podrían haber aumentado los riesgos del inversionista no se elevan al nivel de la culpa negligente capaz de respaldar una determinación de culpa concurrente[387].

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383 *Ibid*. [Traducción del Tribunal]

384 *Artículos de la CDI,* Art. 39, comentario 1.

385 Resp. PHB Q., párr. 181.

386 *Id.*

387 Cl. Rep. Q., párrs. 202-216.

335. La negativa de Perenco a pagar los montos derivados de la Ley 42 no puede caracterizarse como negligente debido a que el Tribunal ya rechazó la alegación de Ecuador de que Perenco no contaba con un fundamento jurídico para de retener los pagos relativos a la Ley 42. El Tribunal ha reconocido que Perenco estaba justificado para retener el pago directo de los valores resultantes de la Ley 42 una vez iniciado el arbitraje[388]. Perenco esperaba legítimamente que Ecuador cumpliera con las resoluciones vinculantes del Tribunal y que esto relevara a Perenco respecto de realizar dichos pagos directos. Por lo tanto, su negativa no puede caracterizarse como un acto negligente que manifestara una desestimación de los derechos de Ecuador por la cual Perenco deba ser penalizada.

336. Además, debido a la posición tomada por dos fiscales ecuatorianos de que la Ley 42 no era una ley tributaria y que los valores recaudados conforme a ella no fueron recaudados por las autoridades fiscales ecuatorianas, no resultaba razonable y realista sugerir que Perenco debería haber pagado los valores derivados de la Ley 42 a Petroecuador y luego presentar una solicitud ante las autoridades fiscales de Ecuador para impugnarlos[389].

337. En relación con la suspensión de las operaciones de Perenco tras el incumplimiento por parte de Ecuador de la Decisión del Tribunal sobre las Medidas Provisionales y la emisión de acciones coactivas, el Tribunal determinó que la suspensión de operaciones de Perenco estaba justificada en virtud del principio *exceptio non adimpleti contractus*. Dicha defensa se encontraba disponible para Perenco y, por lo tanto, Perenco podía suspender lícitamente las operaciones al enfrentarse a un incumplimiento de contrato sin la determinación de incumplimiento por su parte[390]. Y, tal como había declarado el Sr. Perrodo en su testimonio, no hubo interrupciones en las operaciones y la compañía había tomado la decisión de suspenderlas solo como último recurso.

338. Con respecto al supuesto incumplimiento de Perenco relativo a la obtención del acuerdo de Burlington para abandonar los Contratos de Participación y acordar una forma contractual futura no especificada, el Tribunal determinó que Perenco no era responsable por la

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388 *Ibid.*, párrs. 219-221.

389 Cl. PHB Q., párr. 134.

390 Decisión sobre Responsabilidad, párrs. 435 y 704; 412.

decisión de Burlington de no desistir de sus derechos contractuales, que Burlington tenía razones válidas para ello, que Ecuador actuó de manera abrupta y coercitiva durante las negociaciones, y que Ecuador –no Perenco– era responsable del fracaso de las negociaciones[391]. En cualquier caso, el derecho ecuatoriano reconoce que la responsabilidad por la ruptura de las negociaciones contractuales (*culpa in contrahendo*) no surge a menos que existan circunstancias excepcionales. No puede existir responsabilidad si existe una base legítima para finalizar las negociaciones. Incluso si Perenco hubiera terminado las negociaciones (que, tal como descubriera el Tribunal, no fue el caso), la coerción ilícita de Perenco por parte de Ecuador habría sido una justificación más que suficiente[392].

339. Perenco argumentó además que Ecuador no pudo demostrar el segundo elemento de la culpa concurrente, es decir, que dicha culpa interrumpía la cadena de causalidad. La culpa concurrente requiere una conducta por parte del inversionista que rompa el nexo causal de modo tal que el daño pueda considerarse divisible[393]. Perenco señaló que las propias autoridades de Ecuador reconocieron que la conducta indebida del inversionista que resulta una causa concurrente de la pérdida no exime por completo al Estado de su responsabilidad. Ecuador debe probar que Perenco habría sufrido la pérdida incluso si Ecuador no hubiera cometido sus actos ilícitos[394].

340. El Tribunal ya ha confirmado que la conducta ilícita de Ecuador fue la causa inmediata de la caducidad. Ello no fue abordado por Ecuador en la Audiencia sobre *Quantum*[395]. Ecuador no logró demostrar que alguna de las situaciones mencionadas *supra* fuera la causa inmediata de la declaración de caducidad de Ecuador. Fue la elección de Ecuador en el ejercicio de su discreción lo que desencadenó directamente la caducidad[396].

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391 Cl. Rep. Q., párr. 226.

392 *Cf.* Decisión sobre Responsabilidad, párrs. 609-612 y 621-625.

393 Cl. Rep. Q., párr. 213.

394 *Ibid.*, párr. 215.

395 *Ibid.*,párr. 136.

396 *Ibid.*, párr. 234, que cita la Decisión sobre Responsabilidad, párrs. 708 y 710.

341. Además, Perenco había dejado en claro que reanudaría sus operaciones si Ecuador cumplía con la Decisión del Tribunal sobre Medidas Provisionales[397]. Si eso hubiera ocurrido, el Consorcio habría seguido operando los Bloques, y Ecuador no habría declarado la caducidad. La causa inmediata fue, por lo tanto, el incumplimiento por parte de Ecuador de las medidas provisionales, y no la posterior suspensión de operaciones por parte de Perenco[398].

342. Ecuador tampoco declaró la caducidad debido a la actitud de Burlington, sino a causa de una suspensión generada por el incumplimiento por parte de Ecuador de la Decisión sobre Medidas Provisionales.

343. Por último, Perenco señaló que Ecuador no negó que su defensa de culpa concurrente estuviera limitada a la caducidad en ningún caso. Incluso si tuviera alguna base jurídica o fáctica, no podría afectar la indemnización por daños y perjuicios debido a las violaciones por parte de Ecuador del Artículo 4 del Tratado o por su incumplimiento de los Contratos a través del Decreto 662[399].

3. La Decisión del Tribunal

344. El Tribunal recuerda que el Artículo 39 de los *Artículos de la CDI*, titulado "Contribución al perjuicio", establece que en la determinación de la reparación "se tendrá en cuenta la contribución al perjuicio resultante de la acción o la omisión, intencional o negligente, del Estado lesionado o de toda persona o entidad en relación con la cual se exija la reparación"[400]. Si bien la inclusión de la palabra "intencional" amplía el alcance del artículo más allá de la negligencia, dicha ampliación, en opinión del Tribunal, no pareciera ser sustancial. Los Comentarios de la CDI señalaron a este respecto que el enfoque "[s]e refiere a las situaciones llamadas en los ordenamientos jurídicos nacionales 'culpa concurrente',

397 CE-238; CE-243; Decisión sobre Responsabilidad, párr. 692.
398 Cl. Rep. Q., párr. 236.
399 Cl. PHB Q., párr. 137.
400 *Artículos de la CDI*, Art. 39.

'comparative fault', '*faute de la victime*', *etc.*"[401]. El comentario (5) al Artículo señala, además, que "*solamente* permite que se tengan en cuenta las acciones u omisiones que puedan considerarse intencionales o negligentes, es decir, cuando es manifiesto que la víctima de la infracción no ha ejercido la debida diligencia en relación con sus bienes o derechos"[402]. Por consiguiente, el Tribunal parte de la base de que, para que las presentaciones de Ecuador prosperen, el Tribunal debe estar convencido de que Perenco manifestó una falta de cuidado respecto de sus propios bienes o derechos.

345. Ecuador identificó una serie de ocasiones en las que considera que Perenco contribuyó a los daños y perjuicios que ha sufrido.

346. Por orden cronológico aproximado, la primera afirmación se refiere a que la conducta general de Perenco durante el proceso de negociación contribuyó a su pérdida ya que, en varias ocasiones, Perenco rechazó las propuestas de Ecuador, dificultando así el proceso de negociación, y se negó a analizar los borradores de acuerdos de transferencia que Ecuador propuso el 16 de mayo de 2008 y el 10 de julio de 2008; no hizo sus mejores esfuerzos para finalizar la nueva renegociación de los Contratos de Participación en los contratos de servicios acordados en las Actas de octubre de 2008, no aseguró el acuerdo de Burlington respecto del borrador definitivo del acuerdo transitorio a pesar de saber que ello tendría graves consecuencias, y "cínicamente" intentó reabrir las negociaciones en mayo de 2009[403].

347. En segundo lugar, Ecuador sostuvo que la negativa de Perenco a cumplir con el derecho ecuatoriano y pagar los valores derivados de la Ley 42 fue "extremadamente negligente"[404].

348. En tercer lugar, se adujo que el boicot por parte de Perenco a las subastas del petróleo decomisado durante el proceso de acciones coactivas y su amenaza de entablar acciones

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401 *Ibid*., Comentario (1).

402 *Ibid*., Comentario (5).

403 Resp. Rej. Q., párrs. 517-519. [Traducción del Tribunal]

404 Resp. PHB Q., párr. 166; Resp. Rep. PHB Q., párr. 106. En una versión anterior de dicha afirmación, Ecuador parecía argumentar que Perenco fue negligente cuando dejó de pagar a pesar de que poseía la capacidad económica para hacerlo (Memorial de Contestación, párrs. 316 y 323). [Traducción del Tribunal]

legales contra cualquier compañía que participara en la subasta contribuyeron a su pérdida[405].

349. En cuarto lugar, se argumentó que Perenco actuó de forma negligente e imprudente al suspender las operaciones a la vez que conscientemente hacía caso omiso del riesgo de daño ambiental y pérdida de producción. Al hacerlo, Perenco actuó con "descuido imprudente respecto de sus propios derechos" pese a haber específicamente previsto que Ecuador se vería obligado a responder[406].

350. En quinto lugar, se sostuvo que el hecho de que Perenco no reanudara las operaciones en los Bloques (tras haber suspendido las operaciones) a pesar de las invitaciones que recibió para hacerlo también contribuyó al perjuicio que sufrió[407].

351. Antes de abordar estas reclamaciones de culpa concurrente, cabe señalar que la primera violación completada, el Decreto 662, puso en marcha dos tipos principales de daños y perjuicios: (i) una "participación" más reducida para el contratista; y (ii) el prácticamente inmediato cese de la actividad de perforación en ambos Bloques. Perenco de ninguna manera contribuyó al perjuicio causado por tal medida. De hecho, los diversos actos denunciados por Ecuador fueron subsiguientes a la decisión de Ecuador de aumentar la participación del Estado del 50% al 99% en los 'ingresos provenientes de precios superiores a los de referencia'.

352. Algunas de las presuntas instancias de culpa concurrente pueden descartarse de forma expedita. El Tribunal no puede aceptar que la conducta general de Perenco durante el proceso de negociación contribuyó a su pérdida. No se puede considerar que ninguna de las presuntas instancias de culpa concurrente que supuestamente derivan de las respuestas de Perenco a las demandas contractuales de Ecuador constituye una conducta intencional o negligente en el sentido del Artículo 39 de los *Artículos de la CDI*. El Tribunal ya ha

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405 Resp. Rej. Q., párrs. 523-524.

406 Resp. PHB Q., párr. 171; Resp. Rep. PHB Q., párr. 106. [Traducción del Tribunal]

407 Resp. Rej. Q., párr. 505.

resuelto que fue Ecuador quien incrementó sus demandas y amenazas a lo largo del tiempo y que, por su parte, Perenco buscó cumplir con tales demandas en la medida de sus posibilidades[408]. A modo de ejemplo, el hecho de no asegurar el consentimiento de Burlington a los términos del Acta de octubre de 2008 simplemente no puede considerarse como una situación bajo el control de Perenco, y mucho menos un acto intencional o negligente de su parte.

353. Asimismo, por dos razones, la decisión de Perenco de suspender la operación de los dos Bloques en julio de 2009, lo cual, según concluyera el Tribunal en su Decisión, podría estar justificado en virtud del derecho ecuatoriano[409], no puede considerarse como un acto intencional o negligente que contribuyó al perjuicio que sufrió en última instancia. El Tribunal ha determinado que Ecuador incurrió en una violación del contrato al no cumplir con la Decisión del Tribunal sobre Medidas Provisionales, que Perenco poseía el derecho contractual a esperar cumplimiento por parte de Ecuador con dicha Decisión, y que, ante la negativa de Ecuador, Perenco tenía derecho a suspender la operación de conformidad con el derecho ecuatoriano[410]. (El Tribunal también resolvió que, así como Perenco tenía derecho a suspender las operaciones, Ecuador poseía el derecho correlativo a intervenir en aras de operar y proteger los Bloques)[411]. En última instancia, fue la decisión del Estado de declarar la caducidad lo que constituyó la última violación.

354. En la medida en que Ecuador rastrea esto hasta la negativa a pagar los valores derivados de la Ley 42, tal como se analiza *infra*, dada la intermediación de la Decisión sobre Medidas

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408 Decisión sobre Responsabilidad, párr. 625.

409 *Ibid.*, párrs. 434-435.

410 *Ibid.*, párr. 417. En opinión del Tribunal, una simple lectura de la cláusula 22.2.2 indica que las partes contratantes acordaron que cumplirían no solo con un laudo definitivo (es decir, en inglés, '*the award*' emitido por un tribunal), sino que además se mantendrían al tanto de las decisiones del tribunal y cumplirían con ellas (es decir, en inglés, '*the decisions*'). Este último término constituye una categoría más amplia de decisiones de tribunales de la cual el laudo definitivo forma parte. Por lo tanto, en virtud de los Contratos de Participación, Ecuador estaba obligado a cumplir con la Decisión sobre Medidas Provisionales y su incumplimiento constituyó una violación de contrato.

411 *Ibid.*, párr. 704.

Provisionales, el Tribunal no puede determinar que Perenco contribuyó a la decisión de Ecuador de expropiar sus intereses en los Bloques.

355. Además, en la medida en que Ecuador reclama que, por ejemplo, Perenco, el día posterior a la suspensión de operaciones, notificó a sus empleados de los Bloques que sus contratos de empleo habían concluido y, por lo tanto, "fabricó prematuramente una situación en la que era difícil reanudar las operaciones"[412], en opinión del Tribunal, Ecuador no ha cuantificado la pérdida que podría haber sufrido cuando Petroamazonas tuvo que tomar el control de la producción, ni ha demostrado que los despidos resultaron en una pérdida ocasionada a Perenco, por la cual Perenco ahora solicita una indemnización. (El tema de los costos de los empleados está comprendido en el cálculo de lucro cesante relativo al Bloque 21 y no surge en ningún grado significativo en relación con el Bloque 7 ya que la caducidad se aplicó solo al mes restante de la duración del Contrato del Bloque 7).

356. En cuanto a las medidas adoptadas por Perenco para negarse a pagar los valores derivados de la Ley 42 y depositarlos en una cuenta en el extranjero en lugar de pagarlos a Ecuador (lo cual se inició después de que la controversia fuera sometida a arbitraje pero antes de que el Tribunal emitiera su Decisión sobre Medidas Provisionales y, por lo tanto, inicialmente se tomaron sin la cobertura de una decisión del tribunal), en opinión del Tribunal, Perenco *en efecto* asumió el riesgo de que el Tribunal no ratificara su posición jurídica en todos los aspectos. Asimismo, al negarse a pagar los valores derivados de la Ley 42 a Ecuador, era o debería haber sido razonablemente previsible para Perenco que esto pudiera provocar una fuerte respuesta del Estado.

357. De hecho, tal respuesta ocurrió en la notificación de Ecuador de su intención de iniciar acciones coactivas para liquidar la deuda de Perenco relativa a la Ley 42 correspondiente al 2008[413]. En tal sentido, la acción de Perenco exacerbó dicha situación, pero este no es el final del análisis de esta instancia reclamada de culpa concurrente. No mucho después de que el Tribunal sostuviera su primera reunión con las Partes –en la que Perenco había

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412 Resp. Rej. Q., párr. 507. [Traducción del Tribunal]

413 Decisión sobre Medidas Provisionales, 8 de mayo de 2009, párr. 22.

presagiado la posibilidad de una solicitud de medidas provisionales– dicha solicitud fue en efecto presentada. El Tribunal terminó por aceptar la solicitud de Perenco y recomendó la adopción de tales medidas. El Tribunal específicamente recomendó que Ecuador se abstuviera de tomar medidas coactivas contra Perenco y además exhortó a las Partes a negociar un acuerdo de cuenta de depósito en garantía que preservaría sus respectivas reclamaciones por los fondos controvertidos a la espera del resultado del arbitraje[414]. Esto no fue posible para Ecuador. Ecuador explicó su punto de vista de manera respetuosa y no conflictiva de que no podía cumplir con las medidas recomendadas por el Tribunal y que estaba obligada a iniciar las de naturaleza coactiva. No obstante, el Tribunal posteriormente resolvió en su Decisión sobre la Responsabilidad que a Perenco le asistían sus derechos contractuales para esperar que Ecuador cumpliera con las recomendaciones de medidas provisionales del Tribunal.

358. El Tribunal recuerda las conclusiones pertinentes de su Decisión sobre Responsabilidad previa:

> "694. El Tribunal ya concluyó que Perenco tenía una expectativa razonable en virtud de los Contratos de Participación de que Ecuador cumpliría todas las decisiones del Tribunal. Esta expectativa contractual se ve reforzada por la expectativa general de cualquier parte de una disputa, una vez que la diferencia se somete a arbitraje, de que ambas partes buscarán adecuar su conducta a las directivas del Tribunal, en particular para evitar que la disputa se profundice.
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> 695. Ecuador se encontró imposibilitado de cumplir con la Decisión sobre Medidas Provisionales del Tribunal en este caso. El Tribunal puede bien comprender por qué en 2009, en aplicación de una ley interna, Ecuador desearía liquidar los montos reclamados correspondientes a 2008. No obstante, cuando se sometió la cuestión al Tribunal, la obligación de Ecuador de hacer cumplir la ley entró en conflicto con su obligación contractual de cumplir las decisiones del Tribunal. El Tribunal recomendó lo que consideraba una forma razonable de proteger los derechos de ambas partes antes de arribar a una resolución definitiva de la diferencia. Lamentablemente, esto no fue posible a la luz de las circunstancias. Perenco acertadamente señala que si el Estado hubiera optado por no actuar en relación con las coactivas, la disputa no se habría agravado en la forma en que se agravó"[415]. [Énfasis agregado]

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414 *Ibid.*, párrs. 79 y 80.

415 Decisión sobre Responsabilidad, párrs. 694-695.

359. En los procedimientos contradictorios, la conducta que una parte contendiente considera de su adversario como inaceptable o inapropiada es usualmente considerada perfectamente aceptable y apropiada por la otra parte dadas las circunstancias. En opinión del Tribunal, es incorrecto equiparar la protección ferviente de una parte de sus derechos e intereses legales con una conducta dolosa o con la culpa concurrente dentro del significado de los *Artículos de la CDI*. Perenco sí asumió un riesgo cuando unilateralmente decidió pagar los montos resultantes de la Ley 42 en una cuenta *offshore*. No obstante, y de manera decisiva, luego obtuvo la protección por parte de una recomendación del Tribunal de que Ecuador no debía adoptar medidas coactivas, así como una recomendación de que las Partes debían alcanzar un acuerdo de cuenta de depósito en garantía para que se pudieran abonar los valores pendientes impugnados resultantes de la Ley 42 a la espera del resultado del arbitraje (un arreglo que resultó ser inalcanzable en dichas circunstancias).

360. En tal contexto, Perenco tenía derecho a confiar en la recomendación del Tribunal y esto no puede considerarse una contribución intencional o negligente a la pérdida que finalmente sufrió cuando Ecuador aplicó las medidas coactivas. Si bien el acto de autoayuda de Perenco antes de que el Tribunal considerara su solicitud de medidas provisionales fue agresivo y tal vez incluso provocativo, debe considerarse en contexto. El propio Ecuador fue difícilmente inocente en cuanto a la forma en que incrementó la presión sobre Perenco[416]. Finalmente, debido a que se concedieron las medidas provisionales, el Tribunal no considera que la conducta de Perenco a este respecto sea intencional o negligente en el sentido de los Artículos de la CDI desde que dicha conducta fue catalogada bajo el tinte de derecho conferido por la decisión del Tribunal a favor de Perenco. En ese

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416 Como, por ejemplo, al echarle la culpa a Perenco por no haber logrado el acuerdo respecto del Acta y amenazarlo con la rescisión e incluso la expulsión del país. En su Decisión sobre las Cuestiones Pendientes relativas a la Jurisdicción y sobre la Responsabilidad, párrs. 144-145, con referencia a la correspondencia de las Partes, el Tribunal recordó el hecho de que, el 24 de diciembre de 2008, Perenco recibió una carta del Ministerio de Minas y Petróleos que indicaba que "como resultado de la imposibilidad de llegar a un acuerdo definitivo entre las partes, debido a la posición intransigente de su socio Burlington Resources, le agradecería enormemente que inmediatamente instruyera a su equipo de trabajo para que inicie el proceso de reversión del Bloque 7, cuyo contrato finaliza en el año 2010. Además, PERENCO, en su carácter de Operador, también debe asignar inmediatamente a su equipo de negociación a la extinción anticipada del contrato del Bloque 21, de mutuo acuerdo". Perenco luego le escribió al Ministro de Minas y Petróleos solicitándole que reconsiderara la posición expresada en la carta de fecha 24 de diciembre de 2008. Sin embargo, el 21 de enero de 2009, el Ministro de Minas y Petróleos anunció que las negociaciones para que Perenco continúe operando en Ecuador se habían tornado "prácticamente imposibles". [Traducción del Tribunal]

momento, a Perenco le asistía el derecho de actuar como lo hizo y fue Ecuador quien actuó de manera inconsistente con la recomendación del Tribunal.

361. Si bien el Tribunal rechaza, por lo tanto, considerar que se trata de un acto de culpa concurrente, se admite un aspecto del argumento ecuatoriano. Tal como se analiza *infra*, la opinión de Ecuador se aborda mediante el cálculo por parte del Tribunal de la indemnización por daños y perjuicios adeudada. Al decidir el monto de la indemnización pagadera por la imposición ilícita del Decreto 662, el Tribunal ha estado de acuerdo con la opinión de Brattle de que, si una parte que reclama una indemnización por la aplicación de un impuesto no ha, en efecto, abonado una parte o la totalidad del impuesto, no puede ser indemnizada por dicha parte de los daños y perjuicios que se han calculado con base en el supuesto de que el impuesto se encontraba pago. Por lo tanto, el 'ajuste en más' (*true-up*) del Tribunal aborda este aspecto del argumento de la culpa concurrente de Ecuador.

362. Procediendo a abordar la realización de las subastas de petróleo incautado a través de las acciones coactivas, una vez más el Tribunal acepta que Perenco contribuyó al precio deprimido del petróleo obtenido en las subastas coactivas (mediante la amenaza de iniciar demandas contra los potenciales compradores). Pero cuando se lo analiza a la luz de las medidas provisionales ya otorgadas por el Tribunal, Perenco se encuentra mejor posicionado. Debido a que era el comprador del petróleo, Ecuador evidentemente pudo vender el petróleo incautado al precio del mercado, y se benefició del precio de compra deprimido, pero acreditó la deuda de Perenco en virtud de la Ley 42 con el precio deprimido en lugar de aplicar el valor de mercado de ese petróleo. En opinión del Tribunal, y en consideración del estado de la decisión sobre medidas provisionales, logró un enriquecimiento que sería injusto disfrutar[417]. Por dicho motivo, el Tribunal no puede determinar que Perenco actuó de manera intencional o negligente al defender sus derechos y amenazar con demandar a los potenciales compradores. En todas las circunstancias, fue injusto para Ecuador comprar el petróleo a precio de descuento y luego acreditar a Perenco solo dicho valor deprimido. Por esa razón, el Tribunal también incluye esto en el ajuste

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417 Decisión sobre Responsabilidad, párr. 703.

'*true-up*' de la indemnización por daños y perjuicios, un ajuste que esta vez redunda en beneficio de Perenco.

363. Por consiguiente, las diversas reclamaciones de culpa concurrente son infructuosas.

H. La cuestión del ajuste *true-up*

364. Esto lleva al Tribunal a la parte final del cálculo de la indemnización por daños y perjuicios, que consiste en analizar el argumento de ajuste '*true-up*' de Ecuador. La esencia del argumento es que Ecuador considera, *inter alia*, que debido a que el Tribunal no determinó la existencia de un incumplimiento de contrato o del Tratado debido al nivel impositivo de la Ley 42 al 50% y porque, según la lectura de los Contratos por parte de Ecuador, su economía nunca fue afectada al 50% o al 99%, Perenco le debe una cantidad sustancial de los valores pendientes de pago en virtud de la Ley 42. +

1. Posición de Ecuador

365. Ecuador sostuvo que la indemnización por daños y perjuicios adeudada a Perenco era nula, una vez que los valores compensatorios supuestamente adeudados en virtud de la Ley 42 se incluyen en el análisis (el "*true-up*"), o en el mejor de los casos, la Demandada le debía a Perenco USD 114,3 millones[418].

[418] Brattle ER III, Tabla 1. [Traducción del Tribunal]

Tabla 1: Resumen de la indemnización de daños y perjuicios (millones de USD)

			Escenario de Estabilización			
			#1 (Sin estabilización)	#2 (Solo estabilización del Decreto 662, nuevo Factor X)	#3 (umbral impositivo hipotético al 81%)	#4 (Solo estabilización del Decreto 662, side-payment del petróleo)
Daños graves						
Reclamo del TJE (oct-07)	[1]	Ver nota	0,0	3,6	62,9	184,4
Expropiación (jul-10)	[2]	Ver nota	13,7	13,7	13,7	13,7
Perjuicio grave	[3]	[1]+[2]	13,7	17,3	76,6	198,1
True Up						
#1 (Precios de subasta)	[4]	Ver nota	216,2	216,2	216,2	216,2
#2 Precios de mercado a la fecha de explotación	[5]	Ver nota	125,6	125,6	125,6	125,6
#3 Precios de mercado a la fecha de subasta	[6]	Ver nota	83,7	83,7	83,7	83,7
Indemnización neta con el true up						
Valor neto del true up # 1	[7]		{Máx[3]-[4],0}	0,0	0,0	0,0
Valor neto del true up #2	[8]		{Máx[3]-[5],0}	0,0	0,0	72,5
Valor neto del true up #3	[9]		{Máx[3]-[6],0}	0,0	0,0	114,3

Notas y fuentes:
Todos los valores se encuentran expresados en millones de dólares estadounidenses a septiembre de 2015, con inclusión del interés simple.
[1] & [2]: Documentos de Trabajo de Brattle, Tablas M3 & M4.
[4] a [6]: Tabla 2.

366. Ecuador alegó que el Tribunal debería aplicar el '*true-up*' para dar cuenta del monto adeudado por Perenco a Ecuador como consecuencia de que: (i) el Consorcio retiene valores significativos en virtud de la Ley 42 (no solo aquellos que surgen del Decreto 662) desde 2008; y (ii) Ecuador tendrá que financiar las operaciones de los Bloques durante un año completo desde julio de 2009 hasta julio de 2010, mientras acredita al Consorcio con producción.

367. Brattle calculó tres cifras alternativas de '*true-up*' dependiendo del precio utilizado para la representación del petróleo incautado y vendido por Ecuador conforme a las acciones coactivas (precios más altos significan una menor deuda para Perenco)[419]. Ecuador sostuvo que cualquier indemnización debería tomar en consideración la contribución por parte de Perenco al precio de venta reducido aplicable al petróleo subastado en el proceso coactivo. Resulta indiscutible que Perenco boicoteó las subastas, lo que llevó a que el petróleo incautado se vendiera por debajo del precio vigente en el mercado.

368. Ecuador adujo que el monto apropiado a compensar es de USD 216 millones, debido a que Perenco impidió ilegalmente que Ecuador vendiera el petróleo a un precio más alto. En el supuesto de que el Tribunal considere que Ecuador tiene la culpa de la subasta a precios reducidos, la compensación sería de USD 125,6 millones.

369. Brattle explicó que el cálculo de '*true-up*' es de naturaleza *ex post* (es decir, emplea precios reales)[420] a diferencia del enfoque propuesto por Brattle (aceptado por el Tribunal) para calcular la indemnización por daños y perjuicios pagadera a Perenco *ex ante*. El '*true-up*' debe adoptar una perspectiva *ex post* ya que debe evaluar qué montos de la Ley 42 fueron realmente pagados por el Consorcio y qué gravámenes siguen pendientes. Ecuador afirmó que el Profesor Kalt nunca se opuso al concepto[421]. Explicó además que imponer a Perenco

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419 USD 216,2 millones (precio al que Ecuador vendió el petróleo incautado), USD 125,6 millones (precios de mercado a la fecha de producción del petróleo incautado) y USD 83,7 millones (precios de mercado a la fecha de la subasta) (Brattle ER II, Tabla 1, pág. vi). Sin embargo, esta distinción se vuelve irrelevante en tres de los cuatro escenarios de estabilización analizados por Brattle porque los daños netos del *true up* son USD 0 independientemente de la alternativa utilizada (Brattle ER II, Tabla 1, pág. vi).

420 Brattle ER II, párr. 53.

421 Resp. Rep. PHB Q., párr. 101(v).

el cambio en los precios del petróleo cuando optó por retener impuestos era totalmente apropiado, al tiempo que reconoció que la asignación de riesgos era, en última instancia, una cuestión a ser resuelta por el Tribunal. De ahí los cálculos de sensibilidad que realizó para el "*true-up*".

2. Posición de Perenco

370. Perenco no está de acuerdo con la afirmación del profesor Dow de que su análisis del impacto del Decreto 662 en octubre de 2007 no se beneficia del uso de la retrospectiva. Ello no es cierto. Cuando el profesor Dow calculó su "*true-up*" para los valores de la Ley 42 y los gastos operativos 2009-2010 supuestamente adeudados por Perenco a Ecuador, mezcló indebidamente su cálculo *ex ante* con datos *ex post*. Este no fue un error irrelevante. Los precios del petróleo producidos a octubre de 2007 eran significativamente más bajos que los precios reales del mercado. Por lo tanto, en el modelo del profesor Dow, Perenco fue supuestamente indiferente al Decreto 662 en octubre de 2007 a precios pronosticados relativamente bajos, pero dicho precio de la suma de la indiferencia es luego compensado por las evaluaciones reales de la Ley 42 basadas en precios mucho más altos[422].

371. Sobre esta base, el Profesor Dow calculó montos mínimos y máximos de *true-up* de USD 83,7 millones y USD 216,2 millones, respectivamente[423]. Sin embargo, en opinión de Perenco, no existe ninguna razón por la cual deba permitirse la aplicación de datos *ex post* para calcular el supuesto pasivo de Perenco, pero no para calcular el derecho de Perenco a una indemnización por daños y perjuicios. De hecho, dicha mezcla de datos *ex post* y *ex ante* no traslada los riesgos de los precios del petróleo a Ecuador, a pesar de la afirmación del Profesor Dow de que un enfoque *ex ante* "reconoce este traslado de riesgo, para bien o para mal, al momento de la expropiación"[424]. La predisposición del profesor Dow para mezclar y combinar información *ex ante* y *ex post* cuando el resultado es una reducción en la indemnización por daños y perjuicios de Perenco carece de principios.

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422 Cl. Rep. Q., párr. 255.

423 *Véase* Brattle ER III, Tabla 1 (también contenida en párr. 365 *supra*).

424 Cl. Rep. Q., párr. 256, que cita Brattle ER II, párr. 65. [Traducción del Tribunal]

3. La Decisión del Tribunal

372. A los fines del presente caso, el Tribunal considera que, en la medida en que sea apropiado un '*true-up*' con respecto a los gravámenes adeudados en virtud de la Ley 42, tras que el Consorcio suspendiera el pago en abril de 2008, dicho *true-up* debe cumplir con los supuestos *ex ante* de los futuros precios del petróleo. Por supuesto, esta cuestión también se encuentra relacionada con el nivel de imposición tributaria conforme a la Ley 42, que el Tribunal ha decidido que no era ilícito previo a la adopción del Decreto 662 (es decir, la Ley 42 al 50% hasta octubre de 2008 y la Ley 42 al 33% a partir de entonces).

373. De cualquier manera, el Tribunal coincide con la opinión del Profesor Kalt de que Brattle mezcló datos *ex ante* y *ex post* para llegar a sus cálculos de *true-up* para la diferencia entre los pagos de impuestos asumidos en la estimación del VJM del 4 de octubre de 2007 y los montos reales que fueron calculados posteriormente por Ecuador e impuestos en la última parte del período 2007-2008, antes de que los precios se desplomaran, y nuevamente en 2010, cuando los precios se recuperaron.

374. El Profesor Kalt planteó dicha cuestión de la siguiente manera:

> "El hipotético 'comprador' de derechos en el marco de Brattle (Ecuador) ha dicho esencialmente al hipotético vendedor dispuesto (Perenco): 'En el pasado octubre de 2007, acordamos que le pagaría USD X (más intereses) en 2015 para que usted me permita aplicar un impuesto del 99% sobre sus ingresos durante la vida útil de los Bloques. Lo que sucedió fue que las condiciones del mercado fueron tales que terminé cobrando USD 2X sobre usted, pero en realidad solo recibí USD 0,9X de usted. Por lo tanto, voy a deducir USD 1,1X (USD 2X menos USD 0,9X) de X y no tendré que pagarle nada. Después de todo, usted acordó en nuestra transacción de mercado justo en 2007 que me permitiría aplicarle un impuesto del 99%, y usted asumió el riesgo de que mis evaluaciones tributarias fueran de una mayor dimensión de lo que cualquiera de nosotros anticipó originalmente'"[425].

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[425] Kalt ER IV, párr. 56. [Traducción del Tribunal]

375. El Tribunal está de acuerdo con la premisa general de esta crítica[426]. Ecuador no puede tener ambas cosas y debe mantener su postura respecto del cálculo de la indemnización. Con un enfoque *ex ante*, el impacto financiero del impuesto se evalúa a octubre de 2007 y esa es la medida de la indemnización. Sería injusto permitir que Ecuador adopte la posición de que se debe imponer a Perenco un aumento imprevisto de los precios del petróleo y, por lo tanto, mayores gravámenes reales en virtud de la Ley 42 cuando se realice el *true-up*. Dada la aceptación del Tribunal del argumento de Ecuador de que los daños deben calcularse *ex ante*, esto cristaliza el impacto del impuesto al 4 de octubre de 2007 en el escenario 'contrafáctico'. Por lo tanto, Ecuador renuncia al derecho de solicitar montos adicionales en función de la evolución posterior no prevista del mercado. Por consiguiente, el Tribunal no permitirá que la diferencia entre los gravámenes anticipados utilizados en los cálculos del VJM y los montos reales recaudados sean compensados en detrimento de Perenco[427]. El *true-up* calculado originalmente por Brattle fue consecuentemente ajustado a fin de eliminar el uso inicial por parte de Brattle de datos de precios *ex post* que tuvieron el efecto de incrementar el monto que se suponía Perenco le adeudaba a Ecuador.

376. Sin embargo, existen algunos desarrollos *ex post* que deben tomarse en cuenta a los fines de un análisis equitativo. El pago de una indemnización por daños y perjuicios conforme al Decreto 662 calculada sobre una base *ex ante* supone no solo un precio particular del petróleo, tal como acabamos de analizar *supra*, sino también que la persona sujeta al

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426 Brattle admitió esencialmente que este era el caso en Brattle ER III, párr. 103: "Sin embargo, el Profesor Kalt está en lo cierto al afirmar que este enfoque de cálculo del *true-up* le impone a Perenco el riesgo de desviaciones entre las expectativas de precio y de producción implícitas en nuestra evaluación *ex ante* de los daños y perjuicios respecto del Decreto 662, y los precios y la producción imperantes al momento en que se tomaron sendas decisiones en aras de retener el pago, incautar el petróleo y desocupar/ingresar a los bloques. Los precios, los niveles de producción y los costos imperantes al momento de las decisiones aisladas de retener el pago, incautar la producción y desocupar/ingresar a los bloques resultaron ser a veces más altos y, a veces, más bajos que los esperados en octubre de 2007, lo cual resultó en créditos más altos o más bajos a Perenco que aquellos implícitos en el análisis *ex ante* del Decreto 662" [Traducción del Tribunal]. En los párrs. 106 y 107, Brattle trató de justificar su enfoque, pero el Tribunal considera que hacer que ambas partes cumplan con el impacto financiero asumido del impuesto a futuro sería más coherente con el enfoque *ex ante*.

427 El Tribunal observa que Brattle declaró en la nota al pie 6 de su Brattle ER III que llevó a cabo este tipo de cálculo: " ... calculamos una cuarta alternativa, que utiliza las expectativas de precios de octubre de 2007 en lugar de los precios de salida del producto (ya sean reales o de subastas coactivas). Esta cuarta medida previene el riesgo de que Perenco incurra en desviaciones entre las expectativas de precios vigentes cuando Ecuador emitió el Decreto 662, y del momento en el cual Perenco retuvo el pago, Ecuador tomó la producción del consorcio como respuesta y, finalmente, Perenco desocupó/Ecuador ingresó en los bloques. Presentamos estos cálculos en el Apéndice E". [Traducción del Tribunal]

impuesto ilícito realmente lo ha pagado. El Consorcio pagó los valores en virtud de la Ley 42 al 99% desde el 4 de octubre de 2007 hasta el 30 de abril de 2008, cuando abrió la cuenta bancaria *offshore* para el depósito posterior de dichos valores. Perenco se enriquecería injustamente si recibiera una indemnización por daños y perjuicios relativa al período en el que no remitió en realidad las tarifas de la Ley 42 a Ecuador. Por lo tanto, esto ha sido tenido en cuenta por el Tribunal al calcular el *true-up*.

377. Se ha ajustado aun más para reflejar el hecho de que Perenco no logró probar una violación de contrato o de Tratado con respecto a la Ley 42 al 50%. No obstante, refleja la demanda ilícita de un 49% adicional de las ganancias extraordinarias, así como la conclusión del Tribunal de que Perenco habría solicitado la absorción de conformidad con las cláusulas de modificación de los Contratos y las Partes habrían acordado una estabilización del 33% a partir de octubre de 2008.

378. Asimismo, se ha ajustado para abordar la porción que le corresponde a Perenco respecto de los costos de extinción relacionados con la implementación del Decreto 662[428], así como los gastos reclamados por Ecuador durante el plazo de la suspensión de operaciones por parte de Perenco.

379. El *true-up* también debe abordar el tema de las acciones coactivas a favor de Perenco. Como señaló el Tribunal en su Decisión sobre Responsabiliad anterior, resultaba injusto e inequitativo que Ecuador embargara la producción de Perenco para satisfacer su demanda de pago de impuestos y que luego acreditara las sumas a Perenco con el precio deprimido en lugar de aplicar el precio de mercado. El Tribunal reconoce que esto ocurrió en las circunstancias contenciosas del incumplimiento por parte de Ecuador del intento del Tribunal de evitar una mayor agravación de la controversia. También señala que debido a que Ecuador defendió exitosamente las reclamaciones contra la Ley 42 al 50%, el hecho de que Perenco asumiera el riesgo de prevalecer en todas las reclamaciones lo expuso a la situación en la que ahora se encuentra, es decir, que se determinó que solo la recaudación de la Ley 42 al 99% equivale a una violación por la cual se debe pagar una indemnización

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428 Anexos JK-64 y JK-51.

y, por lo tanto, la Ley 42 al 50%, al menos hasta la fecha del Decreto 662, debe ser presuntamente tratada como lícita. Tal como señalara el Tribunal en su Decisión sobre Responsabilidad anterior:

> "Considera que Perenco tenía derecho a esperar que Ecuador desistiera de ejecutar las *coactivas* durante el arbitraje. También considera que en su decisión de retener la totalidad de los montos correspondientes a 2008 reclamados en virtud de la Ley 42, Perenco creyó que el Tribunal aceptaría su reclamo de que ningún monto debido en virtud de la Ley 42 y reclamado por el Estado estaba amparado por los Contratos o el Tratado. Debido a que los reclamos de Perenco no se relacionaban con la Ley 42 al 50%, el Tribunal sostiene que aunque Ecuador debería haber cumplido con la Decisión sobre Medidas Provisionales, las *coactivas* no deberían haberse incluido en el análisis del Tribunal de las medidas que, según se dijo, constituyeron en su conjunto una expropiación indirecta ... Además, en la medida en que se admitió el reclamo de Perenco relativo a que el Decreto 662 al 99% era violatorio del Artículo 4 del Tratado, según los párrafos 606-607 anteriores, la ejecución de las *coactivas* para cobrar el 49% restante reclamado constituyó un incumplimiento de la obligación de conferir un trato justo y equitativo, pero no constituyó una expropiación de la inversión)"[429]. [Énfasis agregado]

380. En última instancia, ninguna de las Partes emerge de esta etapa de la controversia como clara vencedora y el '*true-up*' debe reflejar tal victoria combinada.

I. *Quantum* basado en un 'Modelo Armonizado'

381. Antes de que el Tribunal estime las consecuencias financieras en los Bloques 7 y 21 a la luz de las violaciones de Ecuador, resulta necesario explicar la metodología utilizada para estimar los daños y perjuicios que se otorgarán por cada reclamación individual a la luz de las constataciones fácticas y jurídicas que el Tribunal ha llevado a cabo en las partes precedentes de este Laudo.

382. Tras haber considerado las presentaciones de las Partes, las pruebas periciales y las otras pruebas obrantes en el expediente, el Tribunal ideó un 'modelo armonizado' a través del cual ha calculado la indemnización por daños y perjuicios que se concederá.

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[429] Decisión sobre Responsabilidad, párr. 703.

383. Tal como se describiera *supra*, el Tribunal recibió una valuación de los daños y perjuicios basada en los modelos de hoja de cálculo presentados por el Profesor Kalt[430] y The Brattle Group[431]. Estos modelos empleaban la misma arquitectura general[432], pero diferían respecto de cinco supuestos significativos, que eran los temas principales que separaban a las Partes del modo identificado y abordado en la Sección II.B, así como otras diferencias menores relativas a los supuestos. Dadas estas similitudes, podría producirse un 'modelo armonizado' mediante los ajustes de los modelos en aras de implementar los hallazgos del Tribunal. Estos cambios se describen a continuación y también se plantea el 'modelo armonizado' empleado por el Tribunal.

1. El 'modelo armonizado'

384. El 'modelo armonizado' suprime el efecto del Decreto 662 y de la caducidad para llegar al valor actual neto de los flujos de caja descontados que se habrían derivado de los Bloques 7 y 21. Esto se basa en las decisiones de producción que, según el Tribunal, Perenco habría tomado, de no haber sido por las medidas ilícitas. En pos de abordar las preocupaciones del Profesor Kalt, el Tribunal ha empleado el modelo para realizar una valuación inicial de los daños y perjuicios causados por el Decreto 662 y luego una segunda valuación del daño causado por la declaración de caducidad.

385. El Tribunal considera que en el escenario 'contrafáctico' la Ley 42 al 50% se habría aplicado de manera continua desde octubre de 2007 hasta el 5 de octubre de 2008 y en ese momento, por acuerdo de las Partes, la tasa habría sido del 33%, la cual se habría aplicado desde esa fecha hasta las respectivas fechas de extinción de los dos Contratos de Participación.

386. Por lo tanto, el Tribunal primero pretende pronosticar la producción de ambos Bloques en el marco 'contrafáctico' correspondiente al primer período y para el Bloque 21 para el

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430 Los modelos de hoja de cálculo del Profesor Kalt fueron presentados como Anexo JK-32 en la primera ronda de escritos sobre quantum y como Anexo JK-64 en la segunda ronda.

431 Los modelos de hoja de cálculo de Brattle fueron presentados como Tablas B y C en la primera ronda de escritos sobre quantum y como Tablas P y O en la segunda ronda.

432 Las similitudes entre los modelos reflejaban en parte el hecho de que Brattle tomó los modelos de hoja de cálculo originales del Profesor Kalt y luego los ajustó para reflejar sus propios supuestos y aportes.

segundo período sobre una base *ex ante*. Luego de estimar los niveles de producción, la producción se cotiza según las expectativas *ex ante* en los momentos relevantes. A continuación, el Tribunal también busca estimar el monto del gasto de capital y el gasto operativo, y otros costos, asociados con los niveles de producción asumidos. Los flujos de caja se descuentan a la fecha de valuación relevante y luego se proyectan a la fecha del Laudo a las tasas de interés previas al laudo.

387. Finalmente, el *true-up* se aplica para reflejar los hechos que afectan el cálculo del *quantum*, analizados anteriormente.

388. Las siguientes secciones explican en mayor detalle cada uno de estos pasos tomados en relación con el 'modelo armonizado'.

2. Fechas de Valuación

389. La primera de las suposiciones significativas que tuvieron que ajustarse en el 'modelo armonizado' fueron las fechas de valuación relevantes. En primer lugar, la modelización de daños y perjuicios por parte del Profesor Kalt realizada en el período comprendido entre octubre de 2007 y junio de 2010, sobre una base *ex post*, fue ajustada para reflejar la conclusión del Tribunal de que se debe emplear un análisis *ex ante*. Al mismo tiempo, el enfoque secuencial de 'dos capas' de Brattle fue ajustado para obtener un cálculo desde cero para los daños y perjuicios relativos a la expropiación del 20 de julio de 2010.

390. Esto significa que los daños y perjuicios se calculan respecto del incumplimiento del 4 de octubre de 2007 sobre la base de los flujos de caja previstos hasta junio de 2010, y los flujos de caja que se habrían producido entre octubre de 2007 y junio de 2010 se descuentan retroactivamente hasta la fecha de valuación de octubre de 2007. Respecto de los daños derivados de la expropiación de julio de 2010, esto se basa en los flujos de caja previstos hasta el vencimiento de los Contratos de Participación para los Bloques 7 y 21 (16 de agosto de 2010 y 8 de junio de 2021, respectivamente)[433]. Si se hubiera producido un flujo de caja

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433 Crick WS II.

posterior a julio de 2010, se descontaría retroactivamente a la fecha de valuación de julio de 2010. La tasa de descuento aplicada es del 12%, que fue la tasa utilizada por los peritos de ambas Partes[434].

3. Producción e Inversión

391. El segundo punto respecto del cual difieren los modelos de los peritos fueron la inversión y la producción pronosticada 'de no haber sido por' la conducta de Ecuador. Los modelos del profesor Kalt reflejan el análisis y las proyecciones del Sr. Crick; los modelos de Brattle reflejaron el análisis y las proyecciones de RPS.

392. Para el Bloque 7, el Tribunal ha estimado que se habrían perforado 23 pozos adicionales durante la vigencia del Contrato de Participación del Bloque 7. Cuatro pozos se habrían perforado para enero de 2008 y los 19 restantes se habrían perforado entre febrero de 2008 y agosto de 2009. Asimismo, al haber concluido que los perfiles de producción del Sr. Crick presentados en la Audiencia sobre *Quantum* eran preferibles a los presentados por RPS, y en consonancia con las predicciones del Sr. Crick de nuevos pozos petrolíferos, el Tribunal acepta que todos los pozos del escenario 'contrafáctico' pertenecientes al plazo productivo del Bloque 7 se perforarían en el yacimiento Oso dentro del Área Base. El volumen de producción calculado se basa en las previsiones del Sr. Crick[435], pero se encuentra ligeramente ajustado a los efectos de un análisis *ex ante* a octubre de 2007[436].

393. El Sr. Crick también proporcionó pronósticos para Coca-Payamino. El 'modelo armonizado' adopta dichas cifras sin modificaciones[437].

394. Sobre esta base, el Tribunal pronostica que la producción 'contrafáctica' para el Bloque 7 habría sido la siguiente. Esto se divide en producción 'base', es decir, petróleo que se habría producido además de la producción base, de no haber sido por el Decreto 662, y producción

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434 Kalt ER III, párr. 30 y Brattle ER II, párr. 163.

435 Crick WS III, Apéndice B.

436 El perfil del Sr. Crick incorpora cifras históricas de producción de pozos perforados con anterioridad a 2008 (*véase* Crick WS II, párrs. 6-8, 159 y 172).

437 Crick WS III, Apéndice B; Anexo JK-94.

'incremental', es decir, petróleo que se habría producido además de la producción base, de no haber sido por el Decreto 662. Los factores de ajuste de riesgo utilizados en el Anexo JK-94 fueron aplicados para reflejar las reservas probadas y probables planificadas.

Todos los valores en millones de stb (stock tank barrel)		Producción en riesgo	
		Base incremental - Solo en Oso	Total
Bloque 7 Área Base			
07-oct a 10-jun	7,9	12,3	20,2
10-jul a 10-ago	0,3	0,4	0,8
Total	**8,2**	**12,7**	**21,0**
Coca-Payamino			
07-oct a 10-jun	4,9	No corresponde	4,9
10-jul a 10-ago	0,2	No corresponde	0,2
Total	**5,0**	**No corresponde**	**5,0**
Total del Bloque 7			
07-oct a 10-jun	12,8	12,3	25,1
10-jul a 10-ago	0,5	0,4	0,9
Total	**13,3**	**12,7**	**26,0**

Nota: volúmenes de producción brutos.

[Traducción del Tribunal]

395. En vista de la decisión del Tribunal sobre la cuestión de la prórroga del Bloque 7, no se realizan pronósticos para la producción del Bloque 7 a partir de agosto de 2010.

396. En cuanto al Bloque 21, el Tribunal ha concluido que seis pozos adicionales se habrían perforado antes de la caducidad y 10 habrían sido perforados de manera subsiguiente. Se supone que los pozos previos a la caducidad han sido perforados en base a un cronograma de un pozo por mes con una producción incremental que comenzaría en agosto de 2008, en

consonancia con el cronograma de perforación propuesto por el Sr. Crick[438]. La producción de estos seis pozos refleja la producción de los primeros seis pozos (todos los pozos 1P) según el cronograma del Sr. Crick[439].

397. Se supone que los pozos posteriores a la caducidad han sido perforados en base a un cronograma de un pozo por mes con una producción incremental que comenzaría en agosto de 2010. Además, el Sr. Crick declaró en su testimonio que una pequeña porción de petróleo producido a partir de los pozos nuevos se habría producido en los pozos existentes que representaron un ajuste en sus perfiles según lo descripto en su declaración testimonial[440]. El pequeño ajuste del Sr. Crick ha sido escalado para reflejar el escenario de producción elegido.

Todos los valores en millones de stb	Producción		
	Base	Incremental	Total
Bloque 21			
07-oct a 10-jun	11,1	2,3	13,4
10-jul a 21-jun	23,2	5,8	28,9
Total	**34,3**	**8,0**	**42,3**

Nota: volúmenes de producción brutos.

[Traducción del Tribunal]

4. Precios para la producción de petróleo

398. Tal como se mencionara *supra*, los precios *ex ante* se aplican a la producción de cada Bloque. No obstante, como quedara demostrado por la evidencia sin ser cuestionado, la calidad del petróleo de cada bloque es diferente: el Bloque 7 produjo petróleo crudo de calidad Oriente y la calidad del Bloque 21 fue Napo. Por lo tanto, debieron calcularse los

438 Crick WS III, párr. 3.

439 *Ibid.*, Apéndice B.

440 *Id.*

precios *ex ante* de la producción de petróleo de cada Bloque y para diferentes períodos de tiempo.

399. En primer lugar, se utilizaron los precios WTI *ex ante*. Estos fueron los precios de futuros de NYMEX para las dos fechas clave de valuación: octubre de 2007 y julio de 2010[441]. Estos precios se incrementaron ligeramente para reflejar un componente de seguro integrado en los precios de futuros[442].

400. En segundo lugar, estos precios se ajustaron para reflejar las diferencias de calidad entre el crudo WTI y el producido en Ecuador, es decir, petróleo crudo Oriente y Napo. Dado que el petróleo crudo Oriente es de una calidad relativamente más alta que el crudo Napo, el primero generalmente tiene un precio más alto[443]. Al utilizar los descuentos históricos de los precios aplicados a los dos tipos de petróleo crudo producidos en Ecuador en relación con los precios WTI, se realizó un cálculo de ajuste que disminuyó los precios *ex ante* esperados del WTI para derivar los precios *ex ante* previstos de Oriente, y otro que disminuyó aun más los precios *ex ante* del Napo[444].

401. En tercer lugar, estos precios se ajustan aun más para reflejar la calidad específica del petróleo crudo producido en los Bloques 7 y 21. Estos ajustes se realizaron sobre la base de la relación histórica entre los precios y la calidad de los puntos de referencia de Oriente y Napo y los precios y calidades del aceite específico del yacimiento, y los factores de ajuste de precios específicos de cada yacimiento resultantes guardan coherencia con las fórmulas detalladas en los cálculos propios de Ecuador de los precios del petróleo en sus evaluaciones de la Ley 42[445]. Los factores de ajuste específicos de cada yacimiento se aplican luego a los precios de referencia del petróleo de Ecuador (Oriente para el Área Base

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441 Documentos de Trabajo de Brattle, Tabla D.

442 Brattle ER II, párrs. 214-219.

443 Esta diferencia se refleja en los datos históricos de precios exhibidos en el Anexo JK-57 y en los Documentos de Trabajo de Brattle, Tabla D.

444 Anexo JK-57 y Anexo JK-96; Documentos de Trabajo de Brattle, Tablas D y E; Kalt ER III, párrs. 35-36; Brattle ER II, nota al pie 42.

445 E-228.

del Bloque 7 y Napo para el Bloque 21) en pos de generar precios específicos de cada yacimiento[446].

5. Gastos Operativos (OPEX)

402. Se han adoptado costos operativos de referencia en el 'modelo armonizado'. Esto es consistente con los modelos financieros de ambos peritos, los cuales utilizaron cálculos de costos operativos similares. Sin embargo, estos cálculos se ajustaron para reflejar una perspectiva de modelado *ex ante* a las dos fechas de valuación. Se ha depositado en gran medida confianza sobre los puntos de referencia expuestos en el Anexo JK-64, pero se han ajustado los parámetros del Fondo Ecodesarrollo Región Amazónica para reflejar el aumento en su tasa entre las dos fechas de valuación. Esto se llevó a cabo mediante la aplicación de un promedio para el período comprendido entre los años 2006-2007 del costo correspondiente al período que inicia en octubre de 2007 hasta junio de 2010 y el costo relativo a 2008 para el período posterior a julio de 2010[447]. El 'modelo armonizado' utilizado por el Tribunal continúa inflando los costos operativos de referencia a lo largo del tiempo, lo cual se encuentra en consonancia con la prueba pericial sobre este tema[448]. También acredita a Ecuador el saldo pendiente de tarifas del gasoducto de AGIP a octubre de 2007[449]. En consecuencia, los puntos de referencia de OPEX relevantes para los Bloques 7 y 21 se detallan en la siguiente tabla. Estos valores se aplican a los volúmenes de producción, según corresponda.

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446 Anexo JK-57, Anexo JK-96 y Documentos de Trabajo de Brattle, Tabla E.

447 *Véase* Anexo FL13 (Informe de Auditoría - *Dirección Nacional de Hidrocarburos*).

448 Kalt ER III, párr. 103; Brattle ER II, párrs. 225 y 230.

449 Brattle ER II, nota al pie 232; Documentos de Trabajo de Brattle, Tabla N; Kalt ER III, párr.. 104; Kalt ER IV, pág. 121.

	Bloque 21	Bloque 7	
		Área Base	Coca-Payamino
Costos variables operativos			
USD ($) por barril de crudo de la Contratista			
Amazonian Eco Fund, 2006-2007	$0,49	$0,60	$0,52
Amazonian Eco Fund, 2008 en adelante	$1,02	$0,98	$1,02
Otro	$0,87	$2,33	$2,24
$ por barril de crudo bruto			
No deducible	$0,03	$0,00	$0,05
Deducible	$0,60	$1,19	$1,52
Total	$0,63	$1,19	$1,57
$ por barril de fluido	$0,43	$1,27	$1,62
Costos operativos fijados			
$ por mes	$410,058	$0	$408,512

Nota: estimado en base a la información contable consignada en FL13 & JK-49.

[Traducción del Tribunal]

6. Gastos de Capital (CAPEX)

403. En relación con los niveles de producción previstos para el Bloque 7 tal como se establece *supra*, el gasto de capital de Oso se basa en las pruebas del Sr. Crick que fueran utilizadas por el Profesor Kalt en su modelo financiero[450]. Todos los gastos de capital asumidos reflejan la misma acumulación esencial de costos individuales por pozo y de instalaciones reflejados en los primeros cálculos de *quantum* del Profesor Kalt[451], pero ajustados para reflejar las conclusiones del Tribunal de que (i) se habrían perforado 4 pozos para enero de 2008 y 19 pozos, entre febrero de 2008 y agosto de 2009; y (ii) el punto de partida para los cálculos debe ser tomado sobre una base *ex ante*. Se corre el riesgo de que los gastos de

450 *Véase* Crick WS II, Apéndice C para Oso del Bloque 7; y Anexo JK-94, que incluye los aportes de Crick.

451 Kalt ER III, párr. 112.

capital correspondientes reflejen las reservas probadas y probables planificadas[452]. Los gastos resultantes del Bloque 7 alcanzan un total de USD 140,8 millones.

404. Para el Bloque 21, el gasto de capital se estima al adherir a la información de costos contenida en el plan de desarrollo Yuralpa del Sr. Crick.

405. Los gastos de capital del Sr. Crick se ajustaron para reflejar el cronograma de 16 pozos planteado *supra*. Sujeto al plan de desarrollo Yuralpa del Sr. Crick, la oportunidad temporal del gasto de capital en el manejo de fluidos está ligada al momento en que la tasa general de fluidos (petróleo más agua) se acerca a los umbrales predeterminados. El escenario de 16 pozos da como resultado un aumento más lento de la tasa de fluidos en comparación con el escenario original del Sr. Crick. Este aumento más lento de la tasa de fluidos del 'modelo armonizado' causa retrasos en algunos gastos de capital en relación con el cronograma original del Sr. Crick. Puesto que el Sr. Crick consideró que los primeros 16 pozos de su programa de perforación eran pozos 1P, no es necesario arriesgarse.

406. Además, el Sr. Crick consideró que el agua producida en relación con 24 pozos se habría limitado a 120.000 barriles de agua por día (bwpd). Dada la cantidad de pozos que, según el Tribunal, se habrían perforado, el Tribunal considera que la producción de agua se habría limitado a 120.000 bwpd, es decir, no se necesita abordar la producción adicional de agua y, por lo tanto, no existe una necesidad de ajuste debido a las sensibilidades del agua.

407. Los gastos de capital estimados para el Bloque 21 son los siguientes:

Todos los valores en millones de USD	Capex
Bloque 21	
07-oct a 10-jun	86,3
10-jul a 21-jun	47,8
Total	**134,1**

[Traducción del Tribunal]

[452] *Ibid.*, párr. 107.

7. Valor Actual Neto de los Flujos de Caja

408. La sección que antecede establece los pronósticos del Tribunal para las producciones del Bloque 7 y 21 durante los dos períodos de tiempo. En relación con la producción del plazo comprendido entre octubre de 2007 y junio de 2010, el Tribunal ha fijado el precio de tal producción sobre la base de las expectativas *ex ante* de octubre de 2007 relativas a los precios del petróleo para cada mes durante tal período. Del mismo modo, la producción a partir de julio de 2010 reflejó un precio *ex ante* respecto de las expectativas de julio de 2010 para cada mes después de julio de 2010.

409. Los flujos de caja derivados de cada período luego se descuentan a una tasa del 12% hasta octubre de 2007 y julio de 2010, respectivamente. Luego se suman los flujos de caja descontados derivados para los dos períodos.

410. A continuación, se agrega el interés previo al laudo al valor actual neto al 2007 y al 2010 para proyectarlos a la fecha del Laudo. En primer lugar, se utilizan los rendimientos mensuales de los bonos del Tesoro de EE.UU. a 10 años[453] como tasa de referencia libre de riesgo. Dicha tasa se ubicó en 4,53% en octubre de 2007 y había caído a 1,75% el 11 de septiembre de 2019. En segundo lugar, en cada mes entre las fechas de valuación y la fecha del Laudo, el importe mensual de intereses previos al laudo se calcula al aplicar la tasa de interés mensual[454] al saldo de indemnización por daños y perjuicios pendiente de pago, incluidos todos los intereses previos al laudo acumulados hasta el comienzo de ese mes. En

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453 Esto se basa en el rendimiento anual histórico real publicado del bono del Tesoro de EE.UU. a 10 años según lo informado por la Reserva Federal de EE.UU. y lo publicado diariamente por la Junta de la Reserva Federal de los EE.UU. Estos datos históricos de rendimiento se encuentran en los Anexos JK-39 y JK-77C del Profesor Kalt, así como en los Anexos BR-20 y BR-116 de Brattle. El Tribunal entiende que la Reserva Federal publica rendimientos anualizados. Los peritos han utilizado sistemáticamente la misma serie de rendimientos anualizados a lo largo de los procedimientos sobre quantum. En consecuencia, se ha utilizado una fórmula estándar para traducir los rendimientos anuales publicados a sus equivalentes mensuales: $Tasa\ mensual = (1 + Rendimiento\ Anual)^{1/12} - 1$.

La serie se ha actualizado posteriormente para incluir más datos históricos, y los cálculos más recientes incluyen los intereses devengados previos al laudo hasta septiembre de 2016.

454 *Véase ibid*.

tercer lugar, se aplican diferentes intereses acumulativos previos al laudo que reflejan los diferentes períodos de tiempo sobre los que se acumulan los intereses previos al laudo[455].

411. Por ende, en base a lo que antecede, la estimación de la indemnización original por daños y perjuicios otorgada para el Bloque 7 se calcula en USD 145,2 millones y la correspondiente al Bloque 21, en USD 273,7 millones, resultando en un total de USD 418,9 millones (a partir de septiembre de 2016). Como se explica *infra*, se deben realizar ciertos ajustes adicionales.

8. El True-Up

412. El Tribunal debe ahora considerar las implicaciones para el *quantum* de la indemnización por daños y perjuicios calculada hasta ahora a la luz de las cuestiones analizadas *supra*. Primero, Perenco no pagaba los valores adeudados en virtud de la Ley 42 desde el 30 de abril de 2008 y, en consecuencia, no sufrió pérdidas en ese sentido. Segundo, cuando Perenco pagó esos valores, hubo un 'pago en exceso' de los valores reales pagaderos en virtud de la Ley 42 pagados en relación con aquellos que deberían haberse pagado en función de supuestos de precios *ex ante*. Tercero, las coactivas. Cuarto, y de manera relacionada, Petroamazonas había incurrido en costos al operar el yacimiento en ausencia de Perenco. Quinto, existieron costos de extinción asociados con la salida de Perenco.

413. En consecuencia, el *true-up* ajusta el *quantum* de la indemnización por daños y perjuicios ya calculada de la siguiente manera.

414. En primer lugar, se le acreditan a Ecuador los valores en virtud de la Ley 42 que Perenco debería haber pagado, pero no pagó desde el 30 de abril de 2008 (en base a los precios *ex ante*).

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455 Esto resulta en un mayor interés previo al laudo para la indemnización por daños y perjuicios en relación con la indemnización por daños y perjuicios de octubre de 2007 en comparación con el interés aplicable a 2010.

415. En segundo lugar, Perenco recibe crédito por los valores en virtud del Decreto 662 que sí pagó calculadas sobre la base de los precios del escenario real, pero que excedían los valores del Decreto 662 ya contabilizados en el modelo 'armonizado'.

416. En tercer lugar, se ha tenido en cuenta la confluencia de eventos y las diversas acciones de las Partes en torno a las coactivas.

417. En cuarto lugar, se le acredita a Perenco en el *true-up* los costos de extinción en que realmente incurrió en respuesta al Decreto 662[456]. La participación de Perenco en los costos de extinción nominal es de USD 4 millones[457].

418. En quinto lugar, basado en un análisis *ex ante*, los costos de Petroamazonas basados en los puntos de referencia del costo operativo (como ya se analizara *supra*) y la cantidad de barriles pronosticada por el Sr. Crick para los pozos base durante el período relevante son USD 45,3 millones (esta es la parte de los costos que le corresponde a Perenco).

419. A la luz de estos factores y de los montos involucrados, el Tribunal concluye que una cantidad justa para el *true-up* debería ser de USD 36,4 millones (luego de descontar y proyectar a futuro los flujos de caja pertinentes). Por lo tanto, la compensación total por los Bloques 7 y 21 se reduce por dicha cantidad a USD 382,5 millones.

9. Deducibilidad del OCP

420. El Tribunal concluye que debe haber una deducibilidad tributaria plena en relación con los costos de envío-o-pago del OCP del Bloque 21. En consecuencia, esto adiciona USD 9 millones al *quantum* que se concederá a Perenco. Por consiguiente, la cantidad de USD 382,5 millones se aumenta en USD 9 millones a USD 391,5 millones.

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456 Con fundamento en Anexo JK-64 y Anexo JK-51.

457 Anexo JK-51.

10. Valor de la pérdida de oportunidad

421. Por último, el Tribunal resuelve que dicha pérdida debe valuarse en USD 25 millones. Este monto debe agregarse a la cantidad de USD 391,5 millones, resultando en un total de USD 416,5 millones a partir de septiembre de 2016.

11. Conclusión sobre los Daños y Perjuicios en relación con el Incumplimiento del Tratado y los Contratos de Participación

422. La suma de USD 416,5 millones a la que se llegó *supra*, se proyecta a la fecha de este Laudo mediante la multiplicación de dicha suma por un factor de ajuste de 1,0776 para llegar a la cifra final de USD 448.820.400,00. Esta cantidad representa los daños que se otorgan a Perenco y deberán ser pagados por la Demandada, la República de Ecuador.

III. DAÑOS RECLAMADOS EN RELACIÓN CON LA RECONVENCIÓN AMBIENTAL

A. Circunstancias que llevaron al nombramiento del Sr. Scott MacDonald como Perito Independiente

423. El Tribunal ya se ha referido a su decisión de nombrar a un Perito Independiente si las Partes no lograban avenirse respecto de la reconvención a la luz de las determinaciones de hecho y de derecho contenidas en la Decisión Provisional. A modo de presentación de esta parte del Laudo, cabe reiterar los motivos por los cuales el Tribunal actuó tal como lo hizo.

424. En la Decisión Provisional, el Tribunal realizó las siguientes observaciones:

> "581. El Tribunal ha llegado ahora al punto en el que la reconvención queda circunscripta a las cuestiones principales de hecho y de derecho. El Tribunal ha establecido las cuestiones principales de hecho y derecho que han dividido a los peritos. No obstante, con respecto a muchas de las diferencias entre IEMS/GSI, el Tribunal no se siente capaz de preferir a uno sobre otro. El Tribunal considera que cada uno estaba intentando obtener el mejor resultado para la parte que los instruyó, y que cruzaron los límites entre el análisis objetivo profesional y la representación de las Partes. Es evidente para el Tribunal que los peritos estaban efectivamente apuntando a diferentes objetivos y esto ha dificultado mucho el trabajo de este Tribunal.
>
> …

583. El Tribunal ha analizado cuidadosamente la evidencia y ha determinado que existen ciertas cuestiones de hecho respecto de las cuales le resulta extremadamente difícil tomar decisiones satisfactorias. Como se ha visto, el Tribunal ha rechazado completamente la alternativa de mapeo de IEMS sobre la base de los valores de fondo y ha considerado que la delineación es el medio apropiado para establecer el volumen de los suelos contaminados. Adicionalmente, el Tribunal ha rechazado ciertas interpretaciones de las normas regulatorias ecuatorianas aplicadas por IEMS. Al aplicar las normas regulatorias apropiadas, el Tribunal determinó que los informes periciales de ambas partes no inspiran un suficiente grado de confianza sobre las condiciones reales de los Bloques. El Tribunal piensa que hay demasiados espacios vacíos y conflictos entre las pruebas de IEMS y GSI sobre estas cuestiones clave. Por ejemplo, GSI no tomó muestras en todos los sitios que IEMS evaluó; en algunos sitios en los que IEMS encontró señales de contaminación, GSI también analizó el suelo pero tomó muestras a diferentes profundidades, y GSI utilizó "parámetros indicadores" en lugar de evaluar completamente todos los posibles contaminantes relacionados con yacimientos hidrocarburíferos. El Tribunal razona que estos espacios vacíos deben llenarse y que los conflictos técnicos deben resolverse para poder llegar a una resolución adecuada y justa de la reconvención del Ecuador.

584. En su escrito posterior a la audiencia, Perenco manifestó esencialmente que el Tribunal debe decidir a 'todo o nada':

Las diversas cuestiones técnicas respecto de las cuales GSI y IEMS discrepan tan intensamente son pertinentes no porque el Tribunal deba asumir como tarea propia la elección de los peritos según sus opiniones sobre cada asunto en particular, como si se tratara de una decisión de cafetería, para llegar a un enfoque híbrido. Existe demasiada interrelación entre las cuestiones para que ese tipo de ejercicio resulte productivo. En su lugar, las cuestiones técnicas son pertinentes porque proporcionan la base sobre la cual el Tribunal puede evaluar los dos enfoques, y la base sobre la que el Tribunal debería concluir que el enfoque de GSI es mucho más confiable y fidedigno que el de IEMS.

585. Si bien el Tribunal concuerda con Perenco que dado el estado actual de las pruebas no debería "asumir como tarea propia la elección de los peritos según sus opiniones sobre cada asunto en particular, como si se tratara de una decisión de cafetería" –porque el Tribunal no posee la experiencia técnica requerida para decidir entre los desacuerdos de peritos sobre asuntos de gran precisión técnica– se siente igualmente incómodo con la opción de simplemente elegir un grupo de conclusiones de peritos por encima del otro. El Tribunal bien comprende que la carga de la prueba está sobre la parte que alega algo y podría decirse que debido a las dudas que tiene el Tribunal, Ecuador no ha logrado inclinar la balanza a su favor. Sin embargo, como el Tribunal está convencido de que ha habido daños respecto de los cuales Perenco es probablemente responsable, no está dispuesto a desestimar la reconvención *in limine*. Dada la importancia que le da la Constitución a la protección del medio ambiente, la imagen más clara posible de la condición ambiental de los Bloques –basada en las

ubicaciones de muestreo tanto de IEMS como de GSI– debe ser la que determine la decisión del Tribunal sobre la reconvención.

586. Concordantemente, el Tribunal ha concluido que se requiere una etapa adicional para el esclarecimiento de los hechos a fin de arribar a una conclusión apropiada y justa. El Tribunal no se conforma con emitir una determinación final sobre el grado de responsabilidad de Perenco sobre la base de los informes periciales actuales.

587. Como ya se ha dado a entender, el Tribunal pretende designar su propio perito ambiental independiente, quien recibirá instrucciones para aplicar las determinaciones del Tribunal explicadas precedentemente y trabajará con el Tribunal y las Partes para permitirle al Tribunal evaluar la extensión de la contaminación en los Bloques por la cual se adeuda una indemnización.

588. El Tribunal desea destacar el hecho de que el perito elegido para llevar a cabo esta investigación (luego de consultarlo con las Partes para garantizar su completa independencia e imparcialidad) será el perito del Tribunal y el único responsable ante el Tribunal. A su debido tiempo, el Tribunal proporcionará un protocolo para el perito donde se establezcan las cuestiones precisas a responder de acuerdo con las conclusiones de esta Decisión. Se les permitirá a las Partes estar presentes cuando el perito y su equipo desarrollen las investigaciones necesarias. Además, las Partes recibirán una copia del informe pericial y se les permitirá realizar observaciones sobre él a su debido tiempo. Naturalmente, los costos resultantes en este ejercicio serán inicialmente erogados por las Partes en iguales proporciones y el Tribunal asignará posteriormente los costos en el momento en que corresponda.

…

593. Habiendo dicho esto, el Tribunal considera muy conveniente que las Partes se tomen un tiempo para digerir adecuadamente el contenido de esta Decisión y sus implicancias para la situación general, y podrían querer considerar la posibilidad de someterse a un proceso de mediación o algún procedimiento consensual para alcanzar una cifra recíprocamente aceptable. Teniendo en cuenta las conclusiones del Tribunal con relación a: (i) los valores de fondo; (ii) la aplicación temporal de la Constitución de 2008 a los hechos de este caso; (iii) las normas aplicables en virtud del derecho ecuatoriano; (iv) el cambio en la Constitución de 2008 respecto del plazo de prescripción; (v) la crítica del Tribunal a las restringidas prácticas de muestreo de GSI; (vi) el rechazo del Tribunal al mapeo por parte de IEMS y a sus costos unitarios de remediación; y (vii) el hecho de que el Tribunal no permitirá el muestreo de áreas de los Bloques en las que los peritos de cualquiera de las Partes no hayan tomado previamente muestras, el Tribunal cree que es improbable que las cuestiones restantes den lugar a un laudo de daños por un monto cercano al reclamado por Ecuador. Sin lugar a dudas, las Partes tendrán todo esto en cuenta –así como el costo considerable de las investigaciones adicionales que el Tribunal considera absolutamente necesarias para arribar a un resultado

> justo– dadas las circunstancias del caso, al decidir si es posible llegar a una resolución mutuamente satisfactoria de este aspecto de la controversia.
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> 594. El Tribunal tiene una firme preferencia y esperanza de que, luego de tomar conocimiento de esta Decisión y considerar las conclusiones del Tribunal, los aspectos legales de la reconvención sean suficientemente aclarados como para permitir a las Partes llegar a un acuerdo sobre el monto apropiado de indemnización con o sin la asistencia de un perito independiente o una determinación final del Tribunal. Si se llegara a tal acuerdo, será registrado e incluido en el Laudo del Tribunal. Si no se alcanzara un acuerdo, el Tribunal aguardará los resultados del trabajo de su perito y tomará una decisión final que se incluirá en el Laudo".

425. Finalmente, las Partes no lograron llegar a un acuerdo. Luego, entrevistaron conjuntamente al Sr. Scott MacDonald y acordaron su nombramiento como Perito Independiente, recomendación que el Tribunal aceptó. En consecuencia, el Sr. MacDonald fue nombrado Perito Independiente formalmente el 6 de julio de 2016[458].

426. El Sr. MacDonald dirigió un equipo de especialistas ambientales de Ramboll Inc. en el diseño y la ejecución de la campaña de muestreo que el Tribunal contempló en su Decisión Provisional sobre la Reconvención. Bajo la supervisión del Tribunal, el Sr. MacDonald creó protocolos de muestreo de campo con la asistencia de José Sananes, Clement Ockay, Miles Ingraham, Tais dos Santos, Pablo Yoshikawa, Adrián Gómez, Guillermo Gloria y Aldo Rodríguez (todos de Ramboll)[459].

B. Antecedentes Procesales

427. Mientras el Sr. MacDonald revisaba los datos de IEMS y GSI, al igual que diseñaba su plan de trabajo, concluyó el procedimiento *Burlington*. Por consiguiente, el 2 de marzo de 2017, el Tribunal invitó a las Partes a realizar comentarios tanto acerca de la Decisión sobre Reconsideración y Laudo de ese tribunal como de su Decisión sobre las Reconvenciones.

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458 Resolución Procesal No. 16.

459 Anexo 2 del Protocolo para la Segunda Visita de Sitio del Perito Independiente a los Bloques 7 y 21 de fecha 27 de octubre 2017.

428. El 18 de abril de 2017, las Partes presentaron sus comentarios. En la misma fecha, Perenco también presentó su Primera Solicitud.

429. El 18 de agosto de 2017, tras la presentación de los escritos de las Partes, el Tribunal emitió su Decisión sobre la Primera Solicitud. Rechazó la Primera Solicitud e hizo reserva de los costos para su determinación futura.

430. El 27 de octubre de 2017, las Partes acordaron el Protocolo para la Segunda Visita del Sitio del Perito Independiente.

431. El 30 de enero de 2018, Perenco presentó una Segunda Solicitud de Desestimación. Perenco además propuso un calendario de presentación de escritos en la carta que acompañaba la Solicitud y sugirió que, mientras el Tribunal consideraba la Segunda Solicitud de Desestimación de Perenco, el Sr. MacDonald suspendiera el trabajo en su informe o bien completara su informe, pero se abstuviera de presentarlo al Tribunal y a las Partes hasta tanto el Tribunal se pronunciara sobre la Segunda Solicitud.

432. El 31 de enero de 2018, el Tribunal invitó a Ecuador a responder a la carta de Perenco de 30 de enero de 2018. Asimismo, el Tribunal invitó a las Partes a acordar, a más tardar, el 5 de febrero de 2018, el calendario de presentación de escritos para la Segunda Solicitud de Desestimación de Perenco.

433. El 5 de febrero de 2018, Ecuador respondió a la carta de Perenco de 30 de enero de 2018 y propuso un calendario de presentación de escritos alternativo para la Segunda Solicitud de Desestimación.

434. El 6 de febrero de 2018, Perenco solicitó al Tribunal autorización para responder a la carta de Ecuador de 5 de febrero de 2018. El mismo día, el Tribunal admitió la solicitud de Perenco de autorización para realizar comentarios sobre la carta de Ecuador de 5 de febrero de 2018.

435. El 8 de febrero de 2018, Perenco respondió a la carta de Ecuador de 5 de febrero de 2018 relativa al calendario y procedimiento para determinar la Segunda Solicitud de Desestimación de Perenco.

436. El 9 de febrero de 2018, Ecuador solicitó al Tribunal autorización para responder a la carta de Perenco de 8 de febrero de 2018. El mismo día, el Tribunal admitió la solicitud de Ecuador.

437. El 12 de febrero de 2018, Ecuador presentó una respuesta a la carta de Perenco de 8 de febrero de 2018.

438. El 15 de febrero de 2018, el Tribunal informó a las Partes que decidiría la Segunda Solicitud, pero que, al mismo tiempo, el trabajo del Sr. MacDonald continuaría. Su Informe de Perito Experto sería presentado a las Partes solo si el Tribunal decidía rechazar la Segunda Solicitud de Desestimación de Perenco.

439. El 15 de marzo de 2018, Ecuador presentó su Contestación a la Segunda Solicitud de Desestimación de Perenco.

440. El 5 de abril de 2018, Ecuador presentó su Réplica sobre la Segunda Solicitud de Desestimación de Perenco.

441. El 26 de abril de 2018, Ecuador presentó su Dúplica sobre la Segunda Solicitud de Desestimación de Perenco.

442. El 30 de julio de 2018, el Tribunal informó a las Partes, mediante una carta de su Secretario, que el Tribunal había resuelto, por mayoría, desestimar la Segunda Solicitud de Desestimación de Perenco y, tal como se indicaba en esa carta, los fundamentos de esta decisión se exponen en el presente Laudo.

443. El 3 de octubre de 2018, el Perito Independiente informó al Tribunal que necesitaría tiempo adicional para completar su trabajo y presentar el Informe de Perito Independiente. No tendría sentido relatar los diversos intercambios entre las Partes y el Tribunal en relación con las demoras inevitables en la producción de lo que resultó ser un informe sumamente detallado, útil e integral.

C. Segunda Solicitud de Desestimación de Perenco para que se Desestime la Reconvención Ambiental

444. Las alegaciones de las Partes y los motivos que condujeron a que el Tribunal rechazara la Segunda Solicitud de Desestimación de Perenco se exponen en los siguientes términos.

1. Argumentos de Perenco

445. En su Segunda Solicitud de Desestimación, Perenco alega que "Ecuador opuso las mismas reconvenciones tanto en los arbitrajes *Burlington* como *Perenco*"[460]. Perenco sostiene que "el arbitraje *Burlington* ha concluido de manera definitiva e irrevocable, y que Ecuador ahora ha percibido el pago del importe total adeudado en relación con las reconvenciones que presentara ante los dos tribunales" en cumplimiento del acuerdo transaccional celebrado entre Burlington y Ecuador de fecha 1 de diciembre de 2017 (el "**Acuerdo Transaccional**")[461]. Perenco sostiene que la transacción de Burlington con Ecuador, y el pago total de la deuda conjunta de las reconvenciones de Burlington y Perenco, significa que deberían desestimarse las reconvenciones de Ecuador en contra de Perenco[462].

446. En su Réplica, Perenco disiente de la afirmación de Ecuador de que su Segunda Solicitud de Desestimación es extemporánea. Perenco sostiene que el hecho de no haber planteado la litispendencia (*lis pendens*) no puede ser óbice para su Solicitud, en tanto "la litispendencia no es un sustituto del cumplimiento de una obligación, cosa juzgada, academicidad o abuso procesal"[463]. Según Perenco, la situación resultante del laudo *Burlington* y el pago por parte de Burlington habría sido la misma, "[i]ncluso en el supuesto de que Perenco hubiese pretendido, y el presente Tribunal hubiese otorgado, una suspensión provisional con base en la litispendencia"[464]. Perenco sostiene además que su conducta no puede ser interpretada como una renuncia, en tanto "no podría haber renunciado de antemano al derecho de ampararse en circunstancias de hecho con efecto

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460 Segunda Solicitud de Desestimación, párr. 6.

461 *Ibid*., párr. 19, que hace referencia al Anexo 3, CE-CC-431. [Traducción del Tribunal]

462 Segunda Solicitud de Desestimación, párr. 1.

463 Réplica, párr. 9.

464 *Ibid.*, párr. 10.

determinante en el arbitraje"[465]. Perenco agrega que la doctrina de los actos propios que invoca Ecuador no puede prosperar en el presente caso, en tanto "Perenco no tuvo un 'comportamiento contradictorio', y Ecuador no cambió su postura amparándose en el hecho de que Perenco no solicitara una suspensión por causa de litispendencia en perjuicio de esta última"[466].

447. En sustento de su solicitud para que se desestimen las reconvenciones de Ecuador, Perenco planteó tres argumentos principales:

> "(1) el pago del pasivo solidario en el marco de las reconvenciones extingue la obligación subyacente de Perenco frente a Ecuador…; (2) las reconvenciones idénticas de Ecuador en el contexto del presente procedimiento resultan académicas en tanto no existe controversia alguna sobre la que deba pronunciarse el presente Tribunal; y (3) las reconvenciones de Ecuador tienen carácter de cosa juzgada debido a que la Decisión sobre Reconvenciones de Burlington ya no se encuentra sujeta a incertidumbre alguna, y el hecho de seguir litigándolas constituiría un abuso procesal"[467].

448. Perenco alega que "el pago por parte de Burlington del pasivo del Consorcio en el marco de las reconvenciones salda y cancela la deuda conjunta de modo tal que, como una cuestión de derecho, Ecuador no puede continuar accionando en contra de Perenco en lo que respecta a esa deuda"[468]. Perenco sostiene que sobre la base del derecho ecuatoriano aplicable la responsabilidad solidaria resulta extinta para todos los deudores solidarios cuando un deudor satisface esa responsabilidad[469]. Según Perenco, Ecuador ahora ha conseguido la satisfacción íntegra en lo que respecta a las reconvenciones[470]. Amparándose en el Anexo 3 del Acuerdo Transaccional, Perenco alega que Ecuador "aceptó que el pago representaba 'el monto principal y los intereses aplicables' ordenado por el tribunal de

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465 *Ibid.*, párr. 12.

466 *Ibid.*, párr. 13. [Traducción del Tribunal]

467 Segunda Solicitud, párr. 20. [Traducción del Tribunal]

468 *Ibid.*, párr. 22.

469 *Ibid.*, párrs. 23-29.

470 *Ibid.*, párr. 30.

Burlington, que se pagaba 'como resolución íntegra y definitiva de las demandas de reconvención sobre medioambiente e infraestructura presentadas por Ecuador contra Burlington'[,] y que al hacerlo '*todas las obligaciones y responsabilidades en relación con las Reconvenciones* contra Burlington y la Decisión sobre las Reconvenciones serán consideradas de *forma irrevocable, íntegra y finalmente pagadas, liberadas y satisfechas*'"[471].

449. Perenco hace hincapié en que Ecuador presentó las mismas reclamaciones, obligaciones y responsabilidades tanto ante el tribunal de *Perenco* como el de *Burlington* sobre la base de que Perenco y Burlington eran solidariamente responsables[472]. Perenco afirma que "ahora Ecuador ha percibido lo que reconoce constituye el cumplimiento íntegro de la obligación que opusiera contra Burlington" y "esa obligación es necesariamente idéntica a aquella que opusiera contra Perenco"[473]. Perenco agrega en este sentido que el hecho "de que los expedientes fácticos ante los tribunales de *Perenco* y *Burlington* difieran en algunos sentidos no significa que las obligaciones subyacentes sean jurídicamente diferentes"[474]. Asimismo, Perenco sostiene que cuador reclamó en forma expresa tanto a Burlington como a Perenco el importe total de la indemnización por daños y no la parte alícuota[475]. Además, Perenco hace hincapié en que "resulta irrelevante la posibilidad de que el Tribunal de *Perenco* pudiere determinar en última instancia una cuantificación superior o inferior de la indemnización por daños en el marco de las reconvenciones", en tanto "se ha cumplido y cancelado la obligación sobre la que se basó esa indemnización por daños"[476]. Perenco pone de relieve que "se ha compensado a Ecuador no solo por los 'montos' que calculara el tribunal de *Burlington*, sino por los daños o perjuicios subyacentes; y no solo por las

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471 *Ibid.*, que cita el Anexo 3, Acuerdo Transaccional, CE-CC-431, pág. 2, CONSIDERANDO (2) y pág. 4, párr. 2 (énfasis en el original). [Traducción del Tribunal]

472 Segunda Solicitud, párrs. 33-35; también Réplica, párrs. 17-19.

473 Segunda Solicitud, párr. 36.

474 Réplica, párr. 23.

475 Segunda Solicitud, párrs. 37-40.

476 *Ibid.*, párr. 41.

obligaciones y responsabilidades que el tribunal de *Burlington* especificara en su Decisión sobre Reconvenciones, sino por las propias reconvenciones"[477].

450. En su Réplica, Perenco responde al argumento de Ecuador de que "Perenco no era signataria del Acuerdo Transaccional y que el pago de Burlington no puede surtir efecto alguno sobre Perenco"[478]. Perenco sostiene que "el efecto del cumplimiento como una cuestión de derecho ecuatoriano no depende ni se deriva del contenido o de la existencia del Anexo 3", en tanto "la obligación se extinguió con el pago íntegro, *ipso jure*"[479]. Además de los argumentos planteados en su Solicitud de Desestimación, Perenco alega que "[n]o tendría sentido reconocer que Burlington buscar[ía] 'contribución', ni que Perenco divulgara este Anexo al presente Tribunal, si el pago que efectuara Burlington a Ecuador fuera solo por su propia responsabilidad limitada"[480].

451. Según la interpretación de Perenco, la disposición en la que se ampara Ecuador "permite a los deudores solidarios transigir su propia parte de una responsabilidad solidaria y prevé que esta transacción sería vinculante solo entre los signatarios"[481]. Sin embargo, Perenco cuestiona la aplicabilidad de esta norma en el contexto del presente caso en el que "Ecuador no 'transigió' con Burlington la parte alícuota del daño ambiental de esta última", sino que "Burlington abonó a Ecuador… *la reparación íntegra* por el daño ambiental que se reclamara contra el Consorcio"[482]. Perenco afirma que "[la Constitución ecuatoriana] le impedía a Ecuador 'transigir' con Burlington algo que no fuera la 'reparación íntegra' por la responsabilidad solidaria" supuestamente según el propio reconocimiento de Ecuador[483]. Además, Perenco rechaza la opinión de que el derecho ecuatoriano no reconoce la noción de declaración recíproca, señalando en este sentido una disposición que estipula que "en virtud de la convención, del testamento o de la ley, puede exigirse a cada uno de los

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477 *Ibid.*, párr. 44, que cita el Anexo 3, CE-CC-431, pág. 4, párr. 2. [Traducción del Tribunal]

478 Réplica, párr. 27, que hace referencia a la Contestación, párrs. 95, 97 y 100.

479 Réplica, párr. 28.

480 *Ibid.*, párr. 37, que cita el Anexo 3, CE-CC-431, pág. 3, párr. 5. [Traducción del Tribunal]

481 Réplica, párr. 32, que hace referencia al Código Civil ecuatoriano, EL-390, Artículo 2363.

482 Réplica, párr. 32 (énfasis en el original).

483 *Ibid.*, párr. 33. [Traducción del Tribunal]

deudores o por cada uno de los acreedores el total de la deuda, y entonces la obligación es *solidaria* o *in sólidum*"[484].

452. Perenco sostiene que "la satisfacción de la responsabilidad de Perenco y Burlington en relación con las reconvenciones también torna abstractas las reconvenciones de Ecuador en el marco del presente arbitraje"[485]. Perenco hace referencia a la jurisprudencia de la Corte Internacional de Justicia en la que la Corte se ha negado a fallar en aquellos casos en donde "las circunstancias que desde entonces se habían producido hacían que careciera de objeto todo fallo", o que la "controversia ha desaparecido porque se ha logrado por otros medios el objeto y fin de la reclamación"[486]. Perenco alega que el presente Tribunal reconoció la academicidad como fundamento separado e independiente en razón del cual desestimar las reconvenciones de Ecuador, pero se abstuvo de hacerlo porque en ese momento la Decisión sobre Reconvenciones de *Burlington* se encontraba sujeta a un procedimiento de anulación[487]. Perenco sostiene que esto ya no es así en tanto "[s]implemente no cabe duda alguna respecto de la transacción definitiva de las reconvenciones de Ecuador"[488].

453. Perenco afirma que el hecho de que "Ecuador considere que el tribunal de *Burlington* debería haber otorgado una indemnización por daños en una suma superior no constituye una controversia que deba decidirse"[489]. Según Perenco, "[l]a academicidad se evalúa de manera objetiva en cuanto a la controversia, no en cuanto a la forma particular de reparación que en definitiva se obtiene"[490]. En sustento de esta afirmación, Perenco sugiere

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484 *Ibid.*, párr. 34, que cita el Artículo 1527 del Código Civil ecuatoriano, CA-CC-128.

485 Segunda Solicitud, párr. 49.

486 *Ibid.*, párr. 53, que cita el *Caso Relativo a Camerún Septentrional, Fallo de 2 de diciembre de 1963, Informes de la C.I.J. de 1963*, pág. 38; *Caso Relativo a los Ensayos Nucleares (Australia c. Francia), Fallo de 20 de diciembre de 1974, Informes de la C.I.J. de 1974*, págs. 270-271, párr. 55.

487 Segunda Solicitud, párrs. 49-50, que hacen referencia a *Perenco Ecuador Limited c. República del Ecuador*, Caso CIADI No. ARB/08/6, Decisión sobre la Solicitud de Perenco de que se Desestimen las Reconvenciones de Ecuador, 18 de agosto de 2017, párrs. 46-51 [en adelante, "Decisión sobre la Primera Solicitud de Perenco"].

488 *Ibid.*, párrs. 50-52. [Traducción del Tribunal]

489 *Ibid.*, párr. 54.

490 *Id.*

que en los casos relativos a los *Ensayos Nucleares* "la controversia había desaparecido, ya que se había logrado efectivamente el objeto por 'otros medios' distintos a la reparación solicitada"[491]. Asimismo, sostiene que, en esos casos, "el hecho de que las *solicitantes* no consideraran concluida la controversia 'no imped[ía] que la Corte arribara a su propia conclusión independiente sobre el asunto'"[492]. Perenco sugiere además que el razonamiento del laudo *Orascom* resulta ilustrativo para la aplicación del principio en el contexto de los arbitrajes entre inversionistas y Estados[493].

454. En su Réplica, Perenco señala que la doctrina de la academicidad no se circunscribe únicamente a aquellos casos en los cuales la reparación solicitada sea de cumplimiento específico[494]. Perenco hace especial hincapié en el laudo *Orascom*. La demandante en ese caso "pretendía una indemnización por daños, no el cumplimiento específico" y "sin embargo, el tribunal desestimó las reclamaciones porque 'las reclamaciones que surgieran de las medidas de Argelia habían dejado de existir debido al acuerdo transaccional' celebrado entre una sociedad controlada por la demandante y Argelia"[495].

455. Perenco sostiene que "las reconvenciones de Ecuador también constituyen cosa juzgada debido al claro carácter definitivo de la Decisión sobre Reconvenciones de *Burlington*[496]. Perenco afirma que "la cosa juzgada impide que se litigue nuevamente la misma controversia" y "resulta aplicable a las copartícipes de las partes de la controversia"[497].

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491 *Ibid.* Párr. 55, que cita el *Caso Relativo a los Ensayos Nucleares (Nueva Zelandia c. Francia), Fallo de 20 de diciembre de 1974, Informes de la C.I.J. de 1974*, párr. 58; *Caso Relativo a los Ensayos Nucleares (Australia c. Francia), Fallo de 20 de diciembre de 1974, Informes de la C.I.J. de 1974*, párr. 55.

492 Segunda Solicitud, párr. 55, que cita el *Caso Relativo a los Ensayos Nucleares (Nueva Zelandia c. Francia), Fallo de 20 de diciembre de 1974, Informes de la C.I.J. de 1974*, párr. 62; *Caso Relativo a los Ensayos Nucleares (Australia c. Francia), Fallo de 20 de diciembre de 1974, Informes de la C.I.J. de 1974*, párr. 59. [Traducción del Tribunal]

493 Segunda Solicitud, párr. 57, que hace referencia a *Orascom TMT Investments S.à.r.l c. República Argelina Democrática y Popular*, Laudo, Caso CIADI No. ARB/12/35, 31 de mayo de 2017, párrs. 488, 492-494, 518-520 y 524-526.

494 Réplica, párr. 40, que hace referencia a la Contestación, párr. 95.

495 Réplica, párr. 41, que cita *Orascom TMT Investments S.à.r.l c. República Argelina Democrática y Popular*, Caso CIADI No. ARB/12/35, Laudo, 31 de mayo de 2017, párr. 524. [Traducción del Tribunal]

496 Segunda Solicitud, párr. 59.

497 *Ibid.*, párr. 60.

Perenco afirma que el presente Tribunal "reconoció que el Laudo *Burlington* constituía formalmente cosa juzgada", pero denegó la Primera Solicitud de Perenco "debido a la incertidumbre respecto de [su] carácter definitivo hasta tanto se decidiera la anulación"[498]. Sostiene además que "no puede existir un argumento residual de que Perenco renunció a la cosa juzgada al no haber planteado anteriormente la litispendencia"[499].

456. En su Réplica, Perenco rechaza la afirmación de Ecuador de que la cosa juzgada resulta inaplicable habida cuenta de que no se cumple el requisito de identidad de las partes[500]. Perenco se ampara en los laudos *Grynberg*, *Apotex III*, y *Ampal-American* para alegar que "la cosa juzgada resulta aplicable a las copartícipes o a otras partes interesadas"[501]. Contrariamente a las alegaciones de Ecuador, Perenco agrega que la relación de partes no exige la titularidad, aun si hasta el momento el principio haya sido aplicado solo en el contexto específico de una relación accionista-sociedad controlante[502]. Perenco afirma que "la relación de partes existe cuando dos entidades comparten una identidad de interés, lo que significa que se beneficiarán o sufrirán de igual manera como consecuencia de un resultado"[503]. Según Perenco, esta identidad de intereses existe entre Perenco y Burlington[504].

457. Perenco niega también el argumento de Ecuador de que desestimar las reconvenciones de Ecuador con fundamento en la cosa juzgada implicaría reconsiderar y revocar la Decisión Provisional del Tribunal del año 2015[505]. Según Perenco, "[e]l Tribunal no necesitaría

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498 *Ibid.*, párr. 62.

499 *Ibid.*, párr. 64. [Traducción del Tribunal]

500 Réplica, párrs. 44 y 46, que hacen referencia a la Contestación, párr. 66.

501 Réplica, párr. 45, que hace referencia a *Rachel S. Grynberg, Stephen M. Grynberg, Miriam Z. Grynberg y RSM Production Corporation c. Granada*, Caso CIADI No. ARB/10/6, Laudo, 10 de diciembre de 2010, párrs. 7.1.5 y 7.2.1; *Apotex Holdings Inc. y Apotex Inc. c. Estados Unidos de América*, Caso CIADI No. ARB(AF)/12/1, Laudo 25 de agosto de 2014, párrs. 7.38 y 7.40; *Ampal-American Israel Corp., EGI-Fund (08-10) Investors LLC, EGI-Series Investments LLC y BSS-EMG Investors LLC c. República Árabe de Egipto*, Caso CIADI No. ARB/12/11, Laudo, párrs. 268-270.

502 Réplica, párr. 47.

503 *Ibid.* [Traducción del Tribunal]

504 *Ibid.*, párrs. 48-50.

505 *Ibid.*, párrs. 51-52, que hacen referencia a la Contestación y párrs.56-58.

incorporar conclusiones inconsistentes ni comprometer en modo alguno su Decisión Provisional", sino que solo decidiría que la Decisión sobre Reconvenciones de *Burlington* "tiene efecto preclusivo desde el momento en que devino cosa juzgada"[506].

458. Perenco también discrepa de la solicitud complementaria de Ecuador al Tribunal de que aplique por analogía el Artículo 51(1) del Convenio del CIADI y analice la prueba que no fuera tomada en consideración por el tribunal de *Burlington*[507]. Perenco alega que el Artículo 51(1) del Convenio del CIADI no permite "reactivar una responsabilidad que ya se ha extinguido" y, en cualquier caso, "ese argumento se encuentra ante el tribunal de *Burlington*, no ante el presente Tribunal"[508].

459. Perenco sostiene además que "incluso si el presente Tribunal concluyera que no se cumple algún requisito formal de la doctrina de cosa juzgada, aun resultaría aplicable la doctrina de abuso procesal"[509]. Según Perenco, decisiones de otros tribunales sustentan la opinión de que la doctrina de abuso procesal impide "oponer reclamaciones duplicadas en el marco de una controversia que ya ha sido dirimida"[510].

460. En su Réplica, aunque Perenco reconoce la cuestión de que a Ecuador le asistía el derecho de iniciar procedimientos en múltiples fueros, recalca que "resultaría un abuso de ese derecho *continuar* impulsando esos procedimientos paralelos después de que Ecuador hubiere obtenido el cumplimiento y el pago íntegros"[511]. Asimismo, afirma que no existe sustento alguno para el argumento de Ecuador de que "el abuso procesal podría ocurrir

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506 Réplica, párr. 52. [Traducción del Tribunal]

507 *Ibid.*, párrs. 51 y 53.

508 *Ibid.*, párr. 53. [Traducción del Tribunal]

509 Segunda Solicitud, párr. 65.

510 *Ibid.*, que cita *Eskosol S.p.A in liquidazione c. República Italiana*, Caso CIADI No. ARB/15/50, Decisión sobre la Solicitud de la Demandada con arreglo a la Regla 41(5), 20 de marzo de 2017, párrs. 134 y 167; *Ampal-American Israel Corp., EGI-Fund (08-10) Investors LLC, EGI-Series Investments LLC y BSS-EMG Investors LLC c. República Árabe de Egipto*, Caso CIADI No. ARB/12/11, Decisión sobre Jurisdicción, 1 de febrero de 2016, párr. 331; *Orascom TMT Investments S.à.r.l c. República Argelina Democrática y Popular*, Caso CIADI No. ARB/12/35, Laudo, 31 de mayo de 2017, párr. 534. [Traducción del Tribunal]

511 Réplica, párr. 57 (énfasis en el original), que hace referencia a la Contestación, párr. 78.

cuando se incoen procedimientos múltiples entre las *mismas partes*"[512]. Además, Perenco alega que no es necesario establecer que el "único fin de continuar con las reconvenciones de Ecuador sería perjudicar a Perenco"[513]. Perenco sugiere que la multiplicación de procedimientos también podría constituir un abuso procesal cuando se realiza "con el fin de evadir una norma de derecho" o "en aras de maximizar sus posibilidades de éxito"[514].

461. En subsidio, si el Tribunal procede a abordar el fondo de las reclamaciones de Ecuador, Perenco sostiene que el Tribunal debería "compensar la totalidad del pago de USD 42 millones por parte de Burlington contra el monto total de cualquier indemnización por daños que el presente Tribunal pudiere determinar en el marco de las reconvenciones"[515]. Según Perenco, el enfoque propuesto por Ecuador es conceptualmente inapropiado, en tanto "el tribunal de *Burlington* adjudicó, y Burlington sufragó, el monto total de la indemnización por daños por la totalidad del presunto daño"[516]. Asimismo, Perenco sugiere que el método propuesto por Ecuador conduciría a una doble recuperación y técnicamente resulta inviable[517]. En su Réplica, Perenco objeta los argumentos de Ecuador por los mismos motivos[518].

462. Perenco rechaza también las objeciones de Ecuador a su solicitud de una resolución del Tribunal que eximiría a Perenco de responsabilidad frente a cualquier reclamación futura con base en una supuesta responsabilidad ambiental y en materia de infraestructura que surgiere de los Bloques 7 y 21[519]. Perenco niega que su solicitud demandaría que el presente Tribunal ejerciera su competencia sobre terceros o materias que no se encuentran contempladas en las reconvenciones de Ecuador[520]. Rechaza también la afirmación de que

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512 *Ibid.*, párr. 59, que cita la Contestación, párr. 78 (énfasis en el original).

513 *Ibid.*, párr. 63, que cita la Contestación, párr. 81.

514 *Ibid.*, párr. 63. [Traducción del Tribunal]

515 Segunda Solicitud, párr. 68.

516 *Ibid.*, párr. 70; véase también Réplica, párr. 66. [Traducción del Tribunal]

517 Segunda Solicitud, párrs. .73-77.

518 Réplica, párrs. 66-72.

519 *Ibid.*, párrs. 73-75, que hacen referencia a la Contestación, párrs. 175 y ss.

520 Réplica, párr. 73.

su solicitud resulta abusiva[521]. Contrariamente a la alegación de Ecuador de que su solicitud es extemporánea, Perenco argumenta que procuró obtener una reparación similar en su Dúplica sobre Reconvenciones[522]. En subsidio, Perenco solicita que "el Tribunal ejercite sus facultades discrecionales en virtud de las Reglas de Arbitraje para considerar y aceptar la solicitud de Perenco aun en el supuesto de que la Regla 40 de las Reglas de Arbitraje del CIADI resultare aplicable en el presente caso y de alguna manera tornare extemporánea la solicitud de Perenco"[523].

463. En su Segunda Solicitud de Desestimación, Perenco pretende que el Tribunal emita una resolución:

> "(a) Que desestime las reconvenciones de Ecuador:
>
> (b) En subsidio:
>
> (i) Que deduzca USD 42.762.619 (el "Pago") de cualquier indemnización por daños que pudiere determinar en relación con las reconvenciones de Ecuador en el marco del presente procedimiento (el "Importe Bruto de las Reconvenciones"), con inclusión de la emisión de una resolución de indemnización por daños cero en el supuesto de que el Importe Bruto de las Reconvenciones fuere inferior al Pago, de modo tal que cualquier indemnización por daños que se le ordene abonar a Perenco en relación con las reconvenciones de Ecuador (el "Importe Neto de las Reconvenciones") no resulte superior al Pago o al Importe Bruto de las Reconvenciones, el que fuere mayor;
>
> (ii) Que declare que Perenco no tiene ninguna otra responsabilidad con respecto a las reconvenciones de Ecuador más allá del Importe Neto de las Reconvenciones;
>
> (iii) Que ordene además que Perenco puede satisfacer el Importe Neto de las Reconvenciones deduciéndolo del importe que Ecuador le adeude a Perenco en virtud del Laudo definitivo del presente Tribunal; y
>
> (iv) Que de otro modo condicione la orden mencionada *supra* a la obtención de garantías satisfactorias por parte de Ecuador de que no ejecutará el Laudo final del presente Tribunal, el Laudo *Burlington*, o el Pago de manera acumulativa, sea mediante compensación o de

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521 *Ibid.*, párrs. 74-75.

522 *Ibid.*, párr. 76.

523 *Ibid.* [Traducción del Tribunal]

otra forma, de modo tal que el Importe Neto de las Reconvenciones resulte el importe total que Ecuador pudiere recuperar contra ambas Perenco y Burlington, o contra cualquiera de ellas, en relación con las reconvenciones en contra de cada una de ellas; y

(c) Que ordene a Ecuador eximir a Perenco de responsabilidad frente a cualquier reclamación futura con base en una supuesta responsabilidad ambiental y en materia de infraestructura que surgiere de los Bloques 7 y 21, ante cualquier jurisdicción, sea arbitral o judicial, de carácter nacional o internacional; y

(d) Que ordene a Ecuador pagar la totalidad de las costas y gastos en el marco del presente arbitraje, así como los honorarios y gastos de Perenco, para la fase de reconvenciones del presente procedimiento[524]."

464. En su Réplica, Perenco pretende que el Tribunal emita una resolución:

"(a) Que desestime las reconvenciones de Ecuador;

(b) En subsidio:

(i) Que deduzca USD 42.762.619 (el "Pago") de cualquier indemnización por daños que pudiere determinar en relación con las reconvenciones de Ecuador en el marco del presente procedimiento (el "Importe Bruto de las Reconvenciones"), con inclusión de la emisión de una resolución de indemnización por daños cero en el supuesto de que el Importe Bruto de las Reconvenciones fuere inferior al Pago, de modo tal que cualquier indemnización por daños que se le ordene abonar a Perenco en relación con las reconvenciones de Ecuador (el "Importe Neto de las Reconvenciones") no resulte superior al Pago o al Importe Bruto de las Reconvenciones, el que fuere mayor;

(ii) Que declare que Perenco no tiene ninguna otra responsabilidad con respecto a las reconvenciones de Ecuador más allá del Importe Neto de las Reconvenciones;

(iii) Que ordene además que Perenco puede satisfacer el Importe Neto de las Reconvenciones deduciéndolo del importe que Ecuador le adeuda a Perenco en virtud del Laudo definitivo del presente Tribunal; y

(iv) Que de otro modo condicione la orden mencionada *supra* a la obtención de garantías satisfactorias por parte de Ecuador de que no ejecutará el Laudo definitivo del presente Tribunal, el Laudo *Burlington*, o el Pago de manera acumulativa, sea mediante compensación o de otra forma, de modo tal que el Importe Neto de

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524 Segunda Solicitud, párr. 79.

las Reconvenciones resulte el importe total que Ecuador pudiere recuperar contra ambas Perenco y Burlington, o contra cualquiera de ellas, en relación con las reconvenciones en contra de cada una de ellas; y

(c) Que ordene a Ecuador eximir a Perenco de responsabilidad frente cualquier reclamación futura con base en una supuesta responsabilidad ambiental y en materia de infraestructura que surgiere de los Bloques 7 y 21, ante cualquier jurisdicción, sea de arbitraje o judicial, de carácter nacional o internacional; y

(d) Que ordene a Ecuador pagar la totalidad de las costas y gastos en el marco del presente arbitraje, así como los honorarios y gastos de Perenco, para la fase de reconvenciones del presente procedimiento[525].

2. Argumentos de Ecuador

465. Ecuador solicita al Tribunal que desestime la Segunda Solicitud de Desestimación de Perenco por sendos motivos[526].

466. Ecuador argumenta que Perenco no puede ampararse en sus excepciones en razón de que son extemporáneas[527]. Ecuador sostiene que, de conformidad con las Reglas 41(1), 26(3) y 27 de las Reglas de Arbitraje del CIADI, "las excepciones deberán[n] oponerse lo antes posible; caso contrario, la práctica es desestimarlas de inmediato"[528]. Ecuador señala que Perenco debería haber invocado la litispendencia cuando Ecuador la introdujo por primera vez en sus reconvenciones[529]. En la opinión de Ecuador, el hecho de que las excepciones de Perenco se plantearan más de seis años después de la introducción de las reconvenciones por parte de Ecuador debiera considerarse una renuncia a estas excepciones[530]. Según Ecuador, Perenco tampoco puede solicitar la desestimación de las reconvenciones de Ecuador en razón de la doctrina de los actos propios[531]. Ecuador alega que se amparó en la participación de Perenco en el procedimiento reconvencional sin que opusiera excepción

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525 Réplica, párr. 77.

526 Contestación, párr. 48.

527 *Ibid.*, párr. 54.

528 *Ibid.*, párr. 55; véase también Dúplica, párr. 51.

529 Contestación, párr. 55.

530 *Ibid.*

531 *Ibid.*, párr. 93; véase también Dúplica, párr. 52.

alguna y, en consecuencia, Ecuador "invirtió un tiempo considerable y fondos públicos en pos de establecer la responsabilidad de Perenco en la creencia de que el presente Tribunal decidiría sobre dicha responsabilidad"[532]. En su Dúplica, Ecuador hace hincapié en que también resulta abusivo el hecho de que Perenco no planteara la litispendencia, no solicitara una suspensión del procedimiento ni la consolidación de las reconvenciones[533].

467. Ecuador sostiene además que las excepciones de Perenco se encuentran prohibidas con fundamento en la cosa juzgada. En particular, Ecuador afirma que la Decisión sobre Reconvenciones de *Burlington* es incompatible con la Decisión Provisional sobre Reconvenciones del presente Tribunal en la que este último adoptó una serie de determinaciones de hecho y de derecho respecto de la reconvención ambiental de Ecuador y, por lo tanto, constituye cosa juzgada[534]. Según Ecuador, "sostener que la Decisión sobre Reconvenciones de *Burlington* constituye cosa juzgada resultaría contrario al principio ampliamente establecido de que es la primera decisión emitida sobre una cuestión lo que constituye cosa juzgada"[535]. Ecuador observa además que estos argumentos han sido propugnados por el Tribunal en sus decisiones precedentes[536].

468. Ecuador sostiene que el carácter definitivo de la Decisión sobre Reconvenciones de *Burlington* no torna abstractas a sus reconvenciones[537], en tanto en el presente caso no se cumplen los requisitos de cosa juzgada[538]. Ecuador reconoce que la Decisión del Tribunal sobre la Primera Solicitud de Desestimación de Perenco determinó que la solicitud era prematura a la luz del procedimiento de anulación relacionado con la Decisión sobre Reconvenciones de *Burlington* que se encontraba en trámite en ese momento[539]. Sin embargo, Ecuador hace hincapié en que el Tribunal solo consideró ese procedimiento como

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532 Dúplica, párr. 55. [Traducción del Tribunal]

533 *Ibid.*, párrs. 42-49.

534 Contestación, párr. 57; Dúplica, párr. 60.

535 Contestación, párr. 58; también Dúplica, párr. 63. [Traducción del Tribunal]

536 Contestación, párrs. 57-58, que citan la Decisión sobre la Primera Solicitud de Perenco, párrs. 36 y 40-42.

537 Contestación, párr. 49.

538 *Ibid.*, párr. 61.

539 *Ibid.*, párr. 50.

"una prohibición a un argumento hipotético al que el Tribunal solo hiciera mención sin aprobarlo; concretamente, que el caso devenía abstracto"[540].

469. Ecuador argumenta que ni Perenco ni el Consorcio eran partes del arbitraje *Burlington*[541]. Ecuador hace hincapié en que Burlington y Perenco son organizaciones jurídica y económicamente independientes[542]. Según Ecuador, "el requisito de identidad de las partes resulta de aplicación estricta con arreglo tanto al derecho internacional como al derecho ecuatoriano", de modo tal que "a los fines del análisis de la cosa juzgada no puede considerarse que los copartícipes en un interés sean las mismas partes"[543].

470. Ecuador alega en subsidio que Burlington y Perenco no son copartícipes en un interés, en tanto "la relación de partes existe únicamente cuando una parte detenta la titularidad de la otra"[544]. En su Dúplica, Ecuador hace hincapié en que los tres tribunales de los casos *Grynberg*, *Apotex III* y *Ampal-America* –en cuyas decisiones se ampara Perenco– "decidieron extender el efecto de la cosa juzgada a los accionistas sobre la base de que, en tanto los accionistas tienen derecho a reclamar por las inversiones de titularidad de una sociedad con arreglo a la legislación en materia de inversiones, deben resultar obligados por cualquier conclusión anterior a la que se hubiese arribado en relación con una reclamación de esta sociedad sobre los mismos hechos"[545]. Según Ecuador, esta lógica no puede extenderse a partes que compartan el mismo interés económico en el resultado de una controversia tal como propone Perenco[546].

471. Ecuador sostiene que no existe identidad de materia entre el presente procedimiento y el procedimiento *Burlington*. Ecuador observa en este sentido un fragmento de la Decisión sobre Reconvenciones de *Burlington* en el que el tribunal indicó que "*arrib[ó] a una*

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540 *Ibid*., que hace referencia a la Decisión sobre la Primera Solicitud de Perenco, párr. 46. [Traducción del Tribunal]

541 Contestación, párr. 63.

542 *Ibid.*, párr. 62.

543 *Ibid.*, párr. 66. [Traducción del Tribunal]

544 *Ibid.*, párr. 67.

545 Dúplica, párr. 114. [Traducción del Tribunal]

546 *Ibid.*, párrs. 115-117.

conclusión distinta de aquella del tribunal en Perenco"[547]. Ecuador observa que existen "diferencias significativas en el expediente probatorio ante el tribunal de *Burlington* y el presente Tribunal" que consisten en diferencias "en la prueba invocada" y "en los testigos así como en las preguntas formuladas a los testigos y peritos en ocasión de las audiencias y de la visita del sitio por parte del tribunal de *Burlington* en la que esos peritos y testigos fueron los mismos"[548]. Ecuador afirma que "el expediente probatorio diferente se tradujo, a su vez, en enfoques radicalmente distintos por parte de los tribunales"[549]. Ecuador dirige la atención del Tribunal, *inter alia*, al hecho de que los dos tribunales "adoptaron enfoques distintos en cuanto a cómo debía evaluarse la magnitud de la contaminación y la obligación de remediarla"[550]. Observa también que el tribunal de *Burlington* decidió ampararse en los peritos nombrados por las partes y en una visita al sitio, mientras que el presente Tribunal decidió nombrar a su propio perito independiente en materia ambiental[551]. En su Dúplica, Ecuador sostiene que, contrariamente a las afirmaciones de Perenco, "cuando dos tribunales separados analizan pruebas diferentes presentadas de diferente manera, no consideran los mismos hechos y, por lo tanto, se pronuncian sobre temáticas diferentes"[552].

472. En caso de que el Tribunal determine que la Decisión sobre Reconvenciones de *Burlington* tiene carácter definitivo y vinculante en el marco del presente procedimiento, Ecuador solicita al Tribunal que aplique por analogía el Artículo 51(1) del Convenio del CIADI sobre revisión de los laudos en aras de "cumplir su misión y analizar las pruebas nuevas ante sí, que no fueran tenidas en consideración por el tribunal de *Burlington* al momento de emitir [su] Decisión"[553].

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547 Contestación, párr. 33, que cita *Burlington*, Decisión sobre Reconvenciones, párr. 69.

548 Contestación, párr. 69; también *ibid.*, párrs. 9-47 y Dúplica, párrs.8-34.

549 Contestación, párr. 23.

550 *Ibid.*, párr. 71; véase también Dúplica, párr. 120.

551 Contestación, párr. 71.

552 Dúplica, párrs.125-126 que citan *CME Czech Republic B.V. c. La República Checa*, CNUDMI, Laudo Final, 14 de marzo de 2003, párr. 432. [Traducción del Tribunal]

553 Contestación, párrs. 73-75. [Traducción del Tribunal]

473. En su Dúplica, Ecuador recalca que la información específica del sitio y los resultados analíticos recopilados por el Sr. MacDonald constituyen un "nuevo hecho posiblemente decisivo"[554]. Ecuador está de acuerdo con Perenco en que el Artículo 51(1) del Convenio del CIADI habría facultado al tribunal de *Burlington* a revisar su Decisión sobre Reconvenciones, pero esta lógica resulta aplicable *a fortiori* ante este Tribunal mientras se dirime el presente arbitraje[555]. Ecuador alega además que tendría derecho a iniciar un procedimiento con arreglo al Artículo 51(1) del Convenio del CIADI, en el supuesto de que el presente Tribunal ratificara la Solicitud de Perenco[556]. Para tal fin, Ecuador solicita que se le comunique el Informe Pericial Independiente del Sr. MacDonald, incluso si en última instancia el Tribunal aceptare la Solicitud de Perenco[557].

474. Ecuador rechaza la afirmación de Perenco de que sus reconvenciones constituyen un abuso procesal. Ecuador sostiene que la doctrina de abuso procesal resulta inaplicable en el presente caso por sendos motivos. En primer lugar, Perenco debería establecer que el único objeto de continuar con las reconvenciones de Ecuador sería perjudicar a Perenco, o que de otro modo resultaría abusivo, lo que no sucede en el presente procedimiento[558]. Amparándose en los laudos dictados en el marco de *Lauder* y *Busta*, Ecuador asevera además que impulsar procedimientos paralelos en aras de maximizar las posibilidades de éxito no constituye un abuso procesal[559]. Ecuador agrega que los casos que cita Perenco sugieren que para que se determine la existencia de abuso procesal "la controversia debe ser incoada por la misma demandante contra la misma demandada"[560]. En la opinión de Ecuador, los tribunales de *Orascom* y *Ampal-American* consideraron que las compañías en distintos niveles de la misma cadena de titularidad resultaban la misma parte, mientras que

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554 Dúplica, párrs.137-139. [Traducción del Tribunal]

555 *Ibid.*, párr. 140.

556 *Ibid.*, párr. 141.

557 *Id.*

558 Contestación, párrs. 81-82; Dúplica, párrs. 104-108.

559 Contestación, párrs. 83-85, que hacen referencia a *Lauder c. República Checa*, CNUDMI, Laudo Final, 3 de setiembre de 2001, párr.177 e *Ivan Peter Busta y James Peter Busta c. República Checa*, Caso CCE No. V 2015/014, Laudo Final, 10 de marzo de 2017, párr. 211; también Dúplica, párrs. 104-105.

560 Contestación, párr. 87. [Traducción del Tribunal]

el criterio del tribunal de *Eskosol* fue todavía más acotado, en tanto dicho tribunal sostuvo que dos compañías de la misma cadena de titularidad resultaban partes diferentes[561].

475. Ecuador rechaza la afirmación de Perenco de que las reconvenciones de Ecuador sean abstractas, al alegar que dicha invocación por parte de Perenco resulta inaplicable debido a que todos los pronunciamientos citados por Perenco se relacionan con casos "en los que se exige el cumplimiento específico al efecto de evitar la ocurrencia de daño y, el daño ocurrió en el ínterin, o la parte demandada cumplió de manera voluntaria"[562].

476. Ecuador sostiene que la responsabilidad de Perenco no se extingue en virtud del derecho ecuatoriano[563]. En su Dúplica, Ecuador discrepa del argumento de Perenco de que la cuantificación de daños constituye una cuestión conceptualmente diferente a la propia existencia de responsabilidad[564]. Según Ecuador, "la responsabilidad extracontractual depende de la magnitud del daño sufrido"[565]. Ecuador remarca que al presente Tribunal "se le ha confiado determinar la magnitud del daño al efecto de establecer el grado de responsabilidad de Perenco" a diferencia del tribunal de *Burlington*, cuyo mandato se circunscribiera a la determinación del grado de responsabilidad de Burlington[566].

477. En la opinión de Ecuador, la noción de declaración recíproca resulta ajena al régimen jurídico ecuatoriano en materia de responsabilidad solidaria[567]. Ecuador afirma que tenía derecho a accionar en contra de Burlington, de Perenco, o de ambas[568]. Además, Ecuador

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561 *Ibid.*, que hace referencia a *Orascom TMT Investments S.à.r.l c. República Argelina Democrática y Popular*, Caso CIADI No. ARB/12/35, Laudo, 31 de mayo de 2017, párrs. 494-495; *Ampal-American Israel Corp., EGI-Fund (08-10) Investors LLC, EGI-Series Investments LLC y BSS-EMG Investors LLC c. República Árabe de Egipto*, Caso CIADI No. ARB/12/11, Decisión sobre Jurisdicción, 1 de febrero de 2016, párr. 331; *Eskosol S.p.A in liquidazione c. República Italiana*, Caso CIADI No. ARB/15/50, Decisión sobre la Solicitud de la Demandada con arreglo a la Regla 41(5), 20 de marzo de 2017, párrs.168-169; también Dúplica, párrs. 100-101.

562 Contestación, párr. 95. [Traducción del Tribunal]

563 *Ibid.*

564 Dúplica, párr. 71.

565 *Ibid.*, párr. 77.

566 *Id.* [Traducción del Tribunal]

567 Contestación, párrs. 97-103.

568 *Ibid.*, párr. 96.

sugiere que puede inferirse la no extinción de la deuda de Perenco del hecho de que con arreglo al derecho ecuatoriano la víctima/acreedor puede incoar uno o varios procedimientos en contra de sus codeudores[569].

478. En su Dúplica, Ecuador sostiene que es errónea la invocación que hace Perenco del régimen de responsabilidad solidaria de Ecuador, ya que no se controvierte el efecto del pago íntegro por parte de uno de los codeudores con respecto al otro codeudor[570]. Según Ecuador, la cuestión consiste en determinar "si la primera decisión en el tiempo de un tribunal resulta o no vinculante para el otro tribunal y si torna o no abstracto al segundo procedimiento en el tiempo cuando se inician y se impulsan procedimientos paralelos contra coautores diferentes"[571]. En este sentido, Ecuador reitera que el presente Tribunal ha establecido sus propios criterios para la determinación del daño por el cual se responsabilizará a Perenco y el hecho de que ambos procedimientos presenten expedientes probatorios sustancialmente diferentes[572]. Señala asimismo que el Acuerdo Transaccional de *Burlington* no prevé la terminación del procedimiento de *Perenco* al disponer, *inter alia*, que Ecuador no procurará obtener doble recuperación en el marco del presente procedimiento[573].

479. Ecuador hace especial hincapié en una disposición del Código Civil ecuatoriano que establece que "[l]a transacción no surte efecto sino entre los contratantes. Si son muchos los principales interesados en el negocio sobre el cual se transige, la transacción consentida por uno de ellos, no perjudica ni aprovecha a los otros, salvo, empero, los efectos de la novación, en el caso de solidaridad"[574]. Ecuador sostiene que Perenco no se encuentra obligado por el procedimiento *Burlington* ni por la transacción de *Burlington*[575]. En su Dúplica, Ecuador agrega que el Acuerdo Transaccional de *Burlington* no puede beneficiar a Perenco, ya que "[p]ara que exista una transacción, las partes deben realizar concesiones

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569 *Ibid.*, párrs. 104 y 106.

570 Dúplica, párr. 85.

571 *Id.* [Traducción del Tribunal]

572 *Ibid.*, párrs. 86-90.

573 *Ibid.*, párr.92.

574 Contestación, párr. 100, que cita el Artículo 2363 del Código Civil ecuatoriano, EL-390.

575 Contestación, párr. 97.

recíprocas"[576]. En particular, Ecuador alega que "la compensación de los daños otorgadas en contra de Burlington por los daños en materia ambiental y de infraestructura" formaba parte de una transacción mayor que incluía un descuento al monto adeudado por Ecuador como consecuencia del laudo *Burlington* y la terminación del procedimiento *Burlington*[577].

480. Ecuador también solicita al Tribunal que desestime la solicitud de Perenco de compensar la totalidad del pago de Burlington de cualquier indemnización por daños relacionada con las reconvenciones que otorgare el Tribunal. Aunque Ecuador está de acuerdo con evitar la doble recuperación, mantiene que el enfoque de Perenco es deficiente[578]. Según Ecuador, "[e]l riesgo de doble recuperación solo puede materializarse si el Tribunal determinare exactamente el 'mismo daño' que aquel identificado y cuantificado por el tribunal de *Burlington* según su propia interpretación (diferente) del marco jurídico y los métodos técnicos"[579]. Ecuador sugiere que "[l]a 'misma pérdida' (o el 'mismo daño' en las circunstancias) exige que ambos tribunales evalúen de manera idéntica el objeto de la obligación subyacente"[580].

481. Ecuador no controvierte que alguna parte del daño podría ser la misma que aquella identificada por el tribunal de *Burlington*, aunque alega que mantiene su derecho de reclamar por "cualquier daño y/o costos diferentes o adicionales en materia ambiental y de infraestructura en los Bloques 7 y 21"[581]. Ecuador sostiene que Perenco mantiene su responsabilidad por cualquier contaminación adicional y/o diferente de los volúmenes de suelo, piscinas de lodo, y aguas subterráneas que justifiquen la remediación y/o los costos de remediación adicional en los Bloques 7 y 21[582]. Con respecto al daño en materia de

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576 Dúplica, párr. 69.

577 *Id.* [Traducción del Tribunal]

578 Contestación, párrs. 109-111.

579 *Ibid.*, párr. 118.

580 *Ibid.*, párr. 117. [Traducción del Tribunal]

581 *Ibid.*, párrs.119 y 121. [Traducción del Tribunal]

582 *Ibid.*, párrs. 122-170.

infraestructura, Ecuador sostiene que Perenco mantiene su responsabilidad por cualquier rubro adicional y/o costo adicional identificado en los Bloques 7 y 21[583].

482. En su Dúplica, Ecuador defiende la factibilidad técnica de su enfoque. Hace hincapié en que Perenco no impugnó la factibilidad del enfoque de Ecuador con respecto a la reconvención en materia de infraestructura[584]. En lo que se refiere a su reconvención ambiental, Ecuador argumenta además que su enfoque puede aplicarse cuando el Sr. MacDonald determinare la existencia de contaminación en áreas o sitios claramente distintos de aquellos identificados por el tribunal de *Burlington* o cuando pudiere percibirse la profundidad de contaminación mediante una comparación entre las conclusiones del Sr. MacDonald con respecto al área contaminada y las conclusiones del tribunal de *Burlington* en cuanto al volumen que debe remediarse[585]. Ecuador propone también que en los casos en los que no se encontrare delineada la forma exacta del área contaminada en la Decisión sobre Reconvenciones de *Burlington*, el Tribunal "podría comparar metros cuadrados abstractos de contaminación (no daños monetarios) hallados en la misma profundidad, deducir la superposición, y aplicar al saldo el costo unitario de remediación estimado por el Sr. MacDonald"[586].

483. Ecuador solicita además al Tribunal que rechace la solicitud de Perenco a fin de que emita una resolución para que "Ecuador exima a Perenco de responsabilidad frente a cualquier reclamación futura con base en una supuesta responsabilidad ambiental y en materia de infraestructura que surgiere de los Bloques 7 y 21, ante cualquier jurisdicción"[587]. Ecuador sostiene que esta petición resulta ajena a la Solicitud, en tanto "[l]a determinación de si deben desestimarse o no las reconvenciones de Ecuador en el marco del presente arbitraje no tiene consecuencia alguna en posibles reclamaciones futuras en contra de Perenco, incluso por parte de terceros, con base en la responsabilidad ambiental y en materia de

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583 *Ibid.*, párrs. 171-173.

584 Dúplica, párr. 150.

585 *Ibid.*, párrs. 155-156.

586 *Ibid.*, párr. 162. [Traducción del Tribunal]

587 Contestación, párr. 175.

infraestructura que surgiere de los Bloques 7 y 21, ni tampoco guarda relación alguna con ellas"[588]. Ecuador afirma que Perenco no puede presentar esta petición en esta fase del procedimiento, ya que no ha procurado obtener previamente la autorización del Tribunal de conformidad con la Regla 40(2) de las Reglas de Arbitraje del CIADI[589]. Ecuador hace hincapié en que Perenco no puede invocar ninguna circunstancia especial para su presentación tardía de esta petición[590]. Agrega que la petición de Perenco resulta infundada, en tanto Ecuador no puede asumir responsabilidad por reclamaciones que pudieren surgir de terceros[591]. Por la misma razón, Ecuador sostiene que el Tribunal carece de jurisdicción para otorgar dicha resolución[592]. Ecuador alega que esta petición también resulta abusiva ya que es inconsistente con las demás peticiones formuladas en la Solicitud de Desestimación de Perenco[593].

484. En su Contestación, Ecuador le solicita al Tribunal lo siguiente:

> "(a) Que desestime la Segunda Solicitud de Perenco;
>
> (b) Que desestime las peticiones en subsidio de Perenco;
>
> (c) Que desestime la solicitud de Perenco de que Ecuador la exima de responsabilidad frente a cualquier reclamación futura con base en una supuesta responsabilidad ambiental y de infraestructura que surgiere de los Bloques 7 y 21, ante cualquier jurisdicción, sea de arbitraje o judicial, de carácter nacional o internacional; y
>
> (d) Que le ordene a Perenco que reembolse a Ecuador todos los costos y gastos incurridos en la contestación de la Segunda Solicitud de Perenco, con más intereses[594]."

485. En su Dúplica, Ecuador modificó su solicitud. Le solicita al Tribunal lo siguiente:

> "(a) Que desestime la Segunda Solicitud de Perenco;

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588 *Ibid.*, párr. 177. [Traducción del Tribunal]

589 *Id.*

590 Dúplica, párrs. 172-173.

591 Contestación, párr. 178; Dúplica, párrs. 179-183.

592 Contestación, párr. 179.

593 *Ibid.*, párrs.180-181.

594 *Ibid.*, párr. 183.

(b) Que desestime las peticiones en subsidio de Perenco;

(c) Que desestime la solicitud de Perenco a fin de que Ecuador la exima de responsabilidad frente a cualquier reclamación futura con base en una supuesta responsabilidad ambiental y de infraestructura que surgiere de los Bloques 7 y 21, ante cualquier jurisdicción, sea de arbitraje o judicial, de carácter nacional o internacional;

(d) Que comunique a las Partes el informe pericial del Sr. MacDonald, con inclusión de sus anexos, apéndices y toda la información respaldatoria (en formato nativo); y

(e) Que le ordene a Perenco que reembolse a Ecuador todos los costos y gastos incurridos en la contestación de la Segunda Solicitud de Perenco, con más intereses[595]."

3. Los Motivos del Tribunal para Rechazar la Segunda Solicitud de Desestimación de Perenco

486. Tal como se observara *supra*, el Tribunal rechazó la Segunda Solicitud de Desestimación de Perenco por mayoría. Los motivos son los siguientes.

487. La Segunda Solicitud de Desestimación plantea cuestiones tanto de derecho ecuatoriano como de derecho internacional. El segundo se pronuncia en favor de que el Tribunal continúe el procedimiento de reconvención. En cuanto al primero, tras revisar los alegatos de las Partes, queda demostrado que la posición en virtud del derecho ecuatoriano no es tan clara e inequívoca como Perenco ha sostenido.

488. El Tribunal comienza recordando que, en la Decisión sobre Reconsideración, resolvió que sus decisiones anteriores tienen carácter de cosa juzgada y no pueden reabrirse[596]. Esta conclusión se aplica con el mismo efecto a la Decisión Provisional sobre la Reconvención; el Tribunal no puede reabrir y reconsiderar sus conclusiones, ni explícita ni implícitamente.

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595 Dúplica, párr.190.

596 Decisión sobre la Solicitud de Reconsideración del Ecuador, párr. 43: "Existe amplio consenso respecto de que una vez que un tribunal resuelve cualquiera de las cuestiones de hecho o de derecho sometidas a su consideración por las partes, como fue el caso en la Decisión sobre las Cuestiones Pendientes relativas a la Jurisdicción y sobre la Responsabilidad, su decisión tiene carácter de cosa juzgada".

489. Entre las conclusiones (explícitas e implícitas) a que arribara el Tribunal en la Decisión Provisional sobre la Reconvención y la Decisión sobre la Primera Solicitud de Perenco de de Desestimación [Traducción del Tribunal] se encuentran las siguientes:

(a) El Tribunal gozaba de jurisdicción para entender en la reconvención en contra de Perenco si bien se estaba tramitando una reconvención similar en el procedimiento *Burlington*[597];

(b) la reconvención no era inadmisible[598];

(c) el Tribunal resolvió con carácter definitivo una serie de cuestiones relativas a la interpretación de la Constitución ecuatoriana y las regulaciones ambientales aplicables, y recomendó que las Partes transigieran la diferencia[599];

(d) el Tribunal consideró que la prueba pericial aducida por ambas Partes no era lo suficientemente confiable y aceptó el argumento de Perenco según el cual no sería apropiado "elegir" entre los peritos para moldear un resarcimiento[600];

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597 Decisión sobre la Primera Solicitud de Desestimación de las Reconvenciones de Perenco, párr.44.

598 *Id.*, párrs. 43 y 51.

599 Decisión Provisional sobre la Reconvención, párr.593: "Teniendo en cuenta las conclusiones del Tribunal con relación a: (i) los valores de fondo; (ii) la aplicación temporal de la Constitución de 2008 a los hechos de este caso; (iii) las normas aplicables en virtud del derecho ecuatoriano; (iv) el cambio en la Constitución de 2008 respecto del plazo de prescripción; (v) la crítica del Tribunal a las restringidas prácticas de muestreo de GSI; (vi) el rechazo del Tribunal al mapeo por parte de IEMS y a sus costos unitarios de remediación; y (vii) el hecho de que el Tribunal no permitirá el muestreo de áreas de los Bloques en las que los peritos de cualquiera de las Partes no hayan tomado previamente muestras, el Tribunal cree que es improbable que las cuestiones restantes den lugar a un laudo de daños por un monto cercano al reclamado por Ecuador. Sin lugar a dudas, las Partes tendrán todo esto en cuenta –así como el costo considerable de las investigaciones adicionales que el Tribunal considera absolutamente necesarias para arribar a un resultado justo– dadas las circunstancias del caso, al decidir si es posible llegar a una resolución mutuamente satisfactoria de este aspecto de la controversia".

600 Decisión Provisional sobre la Reconvención, párr.585: "…el Tribunal concuerda con Perenco que dado el estado actual de las pruebas no debería 'asumir como tarea propia la elección de los peritos según sus opiniones sobre cada asunto en particular, como si se tratara de una decisión de cafetería' –porque el Tribunal no posee la experiencia técnica requerida para decidir entre los desacuerdos de peritos sobre asuntos de gran precisión técnica– se siente igualmente incómodo con la opción de simplemente elegir un grupo de conclusiones de peritos por encima del otro. El Tribunal bien comprende que la carga de la prueba está sobre la parte que alega algo y podría decirse que debido a las dudas que tiene el Tribunal, Ecuador no ha logrado

(e) el Tribunal se negó a desestimar el reclamo por falta de satisfacción de la carga de la prueba y resolvió, en su lugar, que, a la luz del gran interés de la Constitución en la protección ambiental y en aras de arribar a un resultado justo, nombraría a un perito independiente si las Partes no lograban negociar una transacción. El Tribunal afirmó que consideraba que esas "investigaciones adicionales [eran] absolutamente necesarias para arribar a un resultado justo– dadas las circunstancias del caso"[601];

(f) asimismo, instruyó en forma explícita lo siguiente: "[s]i no se alcanzara un acuerdo, el Tribunal aguardará los resultados del trabajo de su perito y tomará una decisión final que se incluirá en el Laudo"[602]; y

(g) por último, el Tribunal aseveró, sin limitación alguna, que el informe del perito independiente se daría a conocer a las Partes[603].

490. Al no arribar a una transacción negociada, las Partes coincidieron en que el Sr. MacDonald era adecuado para desempeñarse como Perito Independiente, y el Tribunal aceptó su propuesta conjunta. El Tribunal posteriormente lo instruyó acerca de cómo realizar su muestreo.

(a) El análisis del derecho internacional

491. A partir de lo que antecede, es posible advertir que el Tribunal enfrenta dos cosas juzgadas: (i) una, dictada en el procedimiento que nos ocupa, que, sobre la base de la lógica de la Decisión sobre Reconsideración, y por principio general, resulta vinculante para Perenco y Ecuador; y otra, dictada en un procedimiento paralelo, *después de* que el presente Tribunal

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inclinar la balanza a su favor. Sin embargo, como el Tribunal está convencido de que ha habido daños respecto de los cuales Perenco es probablemente responsable, no está dispuesto a desestimar la reconvención *in limine*. Dada la importancia que le da la Constitución a la protección del medio ambiente, la imagen más clara posible de la condición ambiental de los Bloques –basada en las ubicaciones de muestreo tanto de IEMS como de GSI– debe ser la que determine la decisión del Tribunal sobre la reconvención".

601 Decisión Provisional sobre la Reconvención, párr.593.

602 *Ibid.*, párr.594.

603 Decisión Provisional sobre la Reconvención, párr. 20 de la parte dispositiva: "El Tribunal instruirá al perito a trabajar con la celeridad necesaria a fin de garantizar que pueda informar al Tribunal en forma oportuna. Se le dará oportunidad a las Partes de comentar acerca del informe del perito antes de que el Tribunal tome una decisión o dicte un laudo en esta etapa del procedimiento". [Énfasis agregado].

emitiera su propia Decisión Provisional sobre la Reconvención (que resulta vinculante para Burlington y Ecuador); Perenco solicita ahora que este Tribunal declare que la transacción entre Ecuador y Burlington posterior al Laudo de *Burlington* es vinculante para las Partes de este procedimiento. Perenco alega esencialmente que una cosa juzgada creada por otro tribunal, una vez que este Tribunal se hubiera pronunciado, cuyo laudo se reflejara posteriormente en una transacción entre las partes de tal diferencia, deja sin efecto la cosa juzgada que surge del presente Tribunal.

492. Este argumento tiene diversos aspectos preocupantes.

493. En primer lugar, desde el punto de vista del deber de un tribunal internacional de ejercer su jurisdicción una vez que se ha establecido[604], parece contradictorio que un tribunal que ha adoptado ciertas conclusiones de derecho y de hecho y que ha decidido que debe seguirse un curso de acción en particular debido a los defectos de la prueba pericial que tiene ante sí, deba estar sujeto a la conclusión posterior de otro tribunal que considera cuestiones similares (basadas en otro expediente probatorio y en algunos casos decidiendo de manera diferente que este Tribunal) y que se vio menos afectado por tales defectos de la prueba pericial.

494. Es razonable preguntar por qué la cosa juzgada que constituye la Decisión Provisional sobre la Reconvención del presente Tribunal debe conducir a la cosa juzgada de una decisión posterior en el tiempo emitida por otro tribunal que eligió un modo diferente de estimar el daño sufrido por Ecuador (y que, al momento de dictar su laudo, se negó a poner en vigor la decisión anterior de este Tribunal).

495. En segundo lugar, el Tribunal advierte la solidez del argumento de Ecuador según el cual, en vista del procedimiento que el Tribunal estableciera anteriormente y que se estaba siguiendo en el presente caso, si el Tribunal aceptara el Laudo de *Burlington* como

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604 *SGS Société Générale de Surveillance S.A. c. República Islámica de Pakistán*, Caso CIADI No. ARB/01/13, Decisión sobre Jurisdicción, 6 de agosto de 2003, párr. 187. *Tokios Tokelès c. Ucrania*, Caso CIADI No. ARB/02/18, Decisión sobre Jurisdicción, 29 de abril de 2004, párr. 36; *The Rompetrol Group N.V. c. Rumania*, Caso CIADI No. ARB/06/3, Decisión sobre Jurisdicción y Admisibilidad, 18 de abril de 2008, párr. 115.

resolución definitiva de la reconvención, básicamente estaría reabriendo su Decisión Provisional sobre la Reconvención e injertando en ella motivos y conclusiones de otro tribunal que no guardan coherencia con las propias conclusiones anteriores de este Tribunal[605].

496. Por ende, desde la perspectiva de un régimen jurídico internacional descentralizado en el que los tratados de inversión confieren jurisdicción a tribunales *ad hoc* que, a su vez, gozan de jurisdicción exclusivamente sobre las partes de las diferencias planteadas ante ellos, y donde se acepta que distintos tribunales que consideran cuestiones similares puedan arribar a conclusiones diferentes, a juicio del Tribunal, al momento de la presentación de la Segunda Solicitud de Desestimación de Perenco, era muy tarde para desactivar el proceso que el Tribunal había ordenado que se desarrolle y que estaba próximo a ser completado.

497. En tercer lugar, la única parte que ha intentado tratar la Decisión sobre Reconvenciones de *Burlington* como si tuviera un efecto de cosa juzgada y excluyente en la prosecución continuada de la reconvención actual es Perenco. Del mismo modo, la única parte que caracteriza el Acuerdo Transaccional de *Burlington* como si pusiera fin a las reconvenciones ambientales y de infraestructura es Perenco, que no era parte de ese acuerdo. El acuerdo de 2011 sobre la reconvención entre Burlington y Ecuador, la Decisión de *Burlington* y el Acuerdo Transaccional entre Burlington y Ecuador no parecen establecer que la decisión de ese tribunal hubiera determinado la responsabilidad del Consorcio con carácter definitivo y final.

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605 Decisión Provisional, párr. 581: "El Tribunal ha establecido las cuestiones principales de hecho y derecho que han dividido a los peritos. No obstante, con respecto a muchas de las diferencias entre IEMS/GSI, el Tribunal no prefiere a uno sobre otro. El Tribunal considera que cada uno estaba intentando obtener el mejor resultado para la parte que los instruyó, y que cruzaron los límites entre el análisis objetivo profesional y la representación de las Partes. Es evidente para el Tribunal que los peritos estaban efectivamente apuntando a diferentes objetivos y esto ha dificultado mucho el trabajo de este Tribunal". [Énfasis agregado].

(b) Derecho ecuatoriano sobre el efecto del Acuerdo Transaccional y del Anexo 3 en la responsabilidad de Perenco

498. La cuestión del derecho ecuatoriano se refiere al efecto tanto del Acuerdo Transaccional celebrado entre Ecuador y Burlington como de su Anexo 3 sobre la responsabilidad de Perenco frente a Ecuador en virtud del derecho ecuatoriano.

499. El propósito expreso del Anexo 3 del Acuerdo Transaccional consistía, entre otras cosas, en garantizar que Ecuador no recibiera una doble recuperación por el mismo daño/perjuicio mediante las reconvenciones entabladas en contra de Perenco en el arbitraje *Perenco*. El Acuerdo Transaccional también contemplaba en forma explícita algunas relaciones entre la transacción de Burlington y el arbitraje *Perenco* en curso, al igual que las implicancias de la primera para el segundo.

500. En opinión del Tribunal, el Acuerdo Transaccional demuestra que sus partes no pretendían que ese acuerdo afectara la prosecución de la reconvención ambiental de *Perenco*, excepto en la medida que Burlington obtuviera el compromiso de Ecuador de no perseguirla a fin de conseguir una indemnización adicional y de no pretender una doble recuperación por la indemnización que se pagara de conformidad con el Acuerdo.

501. El argumento de "justicia" que plantea Perenco, a saber: que Burlington no habría logrado verdaderamente una "transacción y liberación completa y definitiva" [Traducción del Tribunal] de las reconvenciones porque seguiría expuesta a una indemnización en virtud de las reconvenciones si este Tribunal ordenara un monto superior en concepto de cuantificación de daños, es socavado por el hecho de que ni Burlington ni Ecuador intentaron modificar los acuerdos de operación conjunta (*JOA*, por sus siglas en inglés) de Burlington con Perenco. Sin el consentimiento de Perenco, las otras dos partes no tenían la posibilidad de intentar modificar los términos de los JOA, en particular, la disposición sobre contribución. Por lo tanto, Perenco se encuentra ahora en las mismas condiciones que aquellas en las que se encontraba con anterioridad a la transacción entre Burlington y Ecuador, a saber: Perenco tiene el derecho contractual de solicitar que Burlington asuma su parte alícuota de la indemnización que otorgue este Tribunal en última instancia.

502. En tanto Perenco se ampara en su responsabilidad solidaria con Burlington para argüir que el Acuerdo Transaccional la exime de su propia responsabilidad, en apariencia, en virtud del Artículo 2363 del Código Civil ecuatoriano, Perenco no puede hacer valer el Acuerdo Transaccional en contra de Ecuador. Dicho artículo reza lo siguiente:

> "La transacción no surte efecto sino entre los contratantes. Si son muchos los principales interesados en el negocio sobre el cual se transige, la transacción consentida por uno de ellos, no perjudica ni aprovecha a los otros; salvo, empero, los efectos de la novación, en el caso de solidaridad"[606].

503. Ecuador explica que, a tenor de esta disposición, la noción de representación mutua del derecho continental no es aplicable. Esto significa que un deudor (es decir, Perenco) no podría ampararse en una transacción celebrada por el acreedor con otro codeudor (es decir, Burlington). El Acuerdo Transaccional surte efecto entre Ecuador y Burlington exclusivamente.

504. Perenco ensaya una interpretación restrictiva del Artículo 2363 del Código Civil ecuatoriano. Parece argüir que la disposición solo aborda situaciones en las que los deudores conjuntos transigen su propia parte de una responsabilidad solidaria y dispone que dicha transacción no surtiría efecto sino entre los contratantes[607]. Por lo tanto, aduce que la disposición no es aplicable en este caso, dado que Ecuador no transigió la parte alícuota de Burlington del daño ambiental con Ecuador. En su lugar, Burlington le pagó a Ecuador una reparación íntegra por el daño ambiental que Ecuador reclamó al Consorcio. En este aspecto, Perenco invoca (además de sus propios escritos en relación con su Primera Solicitud de Desestimación y la Segunda Solicitud de Desestimación) los considerandos del Acuerdo Transaccional y la Decisión sobre Reconvenciones de *Burlington*[608].

505. El argumento de Perenco puede abordarse en dos niveles: primero, si Burlington y Ecuador transigieron la totalidad de la responsabilidad solidaria del Consorcio de manera de obligar

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606 EL-390.

607 Réplica, párr.32.

608 *Burlington*, Decisión sobre Reconvenciones, párr.1099.

a Ecuador frente a Perenco en virtud del Artículo 2363 del Código Civil; y, segundo, si, en el marco del derecho ecuatoriano, el Artículo 2363 del Código Civil opera en la forma que alega Perenco. Con respecto a la primera cuestión, el Tribunal considera que es abordada por el lenguaje del Acuerdo Transaccional que analiza los límites de dicho acuerdo, su relación con la parte dispositiva de la Decisión sobre Reconvenciones de *Burlington* y la relación de ese laudo, a su vez, con el arbitraje Perenco en curso.

506. Aunque Ecuador efectivamente estuviera realizando "*una reclamación integral por el presunto daño ambiental en cada uno de los casos Burlington y Perenco*", el tribunal de *Burlington* contempló claramente que el presente Tribunal podría arribar a una conclusión diferente respecto de la cuantificación de los daños y dejó librada a este Tribunal la posibilidad de moldear su decisión a fin de impedir la doble recuperación por parte de Ecuador. El propio Acuerdo Transaccional reconoce este estado de situación.

507. A juicio del Tribunal, las partes del Acuerdo Transaccional pretendían que la decisión de *Burlington* fuera determinante de la responsabilidad de Burlington frente a Ecuador, pero *no* determinante de la totalidad del daño ambiental causado a Ecuador en términos más generales.

508. Esto parece ser concordante con la noción de responsabilidad extracontractual del sistema de derecho continental ecuatoriano. En este aspecto, el Tribunal acepta el alegato de Ecuador de que la noción de responsabilidad extracontractual del sistema de derecho continental difiere considerablemente de aquella del sistema de *common law*. A diferencia del *common law*, que busca la existencia de un vínculo entre el autor del daño la víctima (de modo de establecer la existencia de un deber de diligencia, cuyo incumplimiento da lugar a responsabilidad), el sistema de derecho continental se preocupa más por determinar si el(los) acto(s) de una persona han causado un daño. Si se produce un daño, surge la responsabilidad extracontractual (sin investigación a fin de determinar si las partes se encontraban en una relación en particular que pudiera dar lugar a responsabilidad extracontractual). Por ende, la explicación de Ecuador, que hace hincapié en la preocupación del derecho continental por la existencia de un daño, brinda sustento a la determinación continuada por parte del Tribunal del alcance total de la contaminación (con

sujeción, por supuesto, a las restricciones que se impusieron al trabajo del Perito Independiente). Ecuador ha argüido que el tribunal de *Burlington* casi seguramente no estimó el alcance de la contaminación con exactitud. (Tal como se verá, el dictamen pericial del Sr. MacDonald brinda sustento a esta opinión). En vista de esa situación, la ausencia de estimación adecuada del daño implicaría que no se compense de manera suficiente a la víctima de la conducta delictiva.

509. El Tribunal cree además que podría considerarse que el tribunal de *Burlington*, que estaba conformado por tres distinguidos árbitros capacitados en derecho continental, estaba familiarizado con el enfoque del sistema de derecho continental respecto de la responsabilidad extracontractual. Los miembros de dicho tribunal no mostraron preocupación al proceder independientemente a decidir la reconvención de *Burlington* si bien su decisión fue dictada después de la Decisión Provisional sobre la Reconvención de este Tribunal y a pesar del hecho de que el operador del Consorcio (Perenco) no se encontraba ante ellos. Además, en lugar de declarar que estaban determinando la responsabilidad del Consorcio en su totalidad, el tribunal de *Burlington* delegó explícitamente en el presente Tribunal la tarea de abordar cualquier riesgo de doble recuperación:

> "69. El Tribunal es consciente de la naturaleza separada de los dos arbitrajes y de su deber de resolver la controversia ante sí únicamente con base en su propio expediente y fondo. Dicho esto, el Tribunal también es consciente del riesgo de doble recuperación, el cual retomará, y del posible riesgo de decisiones contradictorias. Por motivos vinculados con el valor agregado de la coherencia del sistema jurídico, considera que deberían evitarse en la medida de lo posible las decisiones contradictorias sobre cuestiones idénticas; ello, sin sacrificar los derechos de cualquiera de las partes al debido proceso e imparcialidad. En tanto se pronunciará exclusivamente sobre la base del expediente en el marco del presente caso, el Tribunal hará referencia a la Decisión de Perenco en aquellas instancias en las cuales, a pesar de su intención de evitar contradicciones, arribe a una conclusión distinta de aquella del tribunal en Perenco.
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> 70. En lo que respecta al riesgo de doble recuperación (punto (iv) *supra*), Ecuador no controvierte que pretende lo que Burlington denomina 'idéntica compensación traslapada con respecto al mismo daño presunto' en ambos procedimientos. También está de acuerdo con que existe un riesgo de recuperación doble. Siendo este el caso, al término de la Audiencia, Ecuador explicó que no pretende recuperar dos veces la indemnización por daños reclamada, sino que invocará cualquier decisión

> que resulte ser más favorable a su posición. Burlington, por su parte, solicitó que el Tribunal trate expresamente el riesgo de doble recuperación, ya que 'si la parte dispositiva de cualquiera de los dos laudos sobre reconvenciones dispone alguna compensación, se evitaría que Ecuador ejecute el segundo laudo en la medida que ya ha sido compensado por el primero'. El Tribunal trata la doble recuperación *infra* (Sección D)"[609]. [Énfasis agregado]

510. Por lo tanto, en función de lo que antecede, el Tribunal concluye que el Acuerdo Transaccional solo podría haber estado destinado a transigir lo que el tribunal de *Burlington* consideró que era el daño sufrido por Ecuador (con sujeción a reclamos intra-Consorcio en virtud de los JOA aplicables entre los dos socios del Consorcio y, fundamentalmente, con sujeción a lo que decidiría este Tribunal).

511. En cuanto a la segunda cuestión, resulta difícil interpretar el Artículo 2363 de la manera que sostiene Perenco cuando la disposición no establece que es aplicable exclusivamente a transacciones parciales. En cualquier caso, el hecho de la transacción por una parte que tiene responsabilidad solidaria con uno u otros más no permite en sí mismo que una parte ajena a la transacción la invoque. En sus propios términos, el Artículo 2363 exige no solo un vínculo de responsabilidad solidaria, sino también una novación del acuerdo transaccional. Por ende, haciendo una lectura simple de esa disposición, Perenco puede reclamar el beneficio del Acuerdo Transaccional *solo si* ha existido una novación *y* la responsabilidad subyacente es solidaria[610]. No se aduce que el Acuerdo Transaccional entre Ecuador y Burlington haya sido novado en beneficio de Perenco. En efecto, los términos del Acuerdo Transaccional disponen explícitamente lo contrario en tanto los derechos y beneficios de la transacción se limitan de manera expresa a sus partes.

512. Por último, el tribunal de *Burlington* reconoció expresamente "su deber de resolver la controversia ante sí únicamente con base en su propio expediente y fondo" mientras continuara el procedimiento *Perenco*[611]. Este punto, con el que coincide el Tribunal, reviste especial importancia debido a los enfoques fundamentalmente diferentes que adoptan los

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609 *Ibid.*, párrs. 69-70.

610 Contestación, párr. 100.

611 *Burlington*, Decisión sobre Reconvenciones, párr.69.

dos tribunales sobre la reconvención ambiental. El tribunal de *Burlington* decidió realizar una visita a los sitios y basarse en la prueba pericial de IEMS y GSI, eligiendo entre sus respectivas conclusiones acerca de cuestiones particulares. El Tribunal considera que su Perito Independiente se encuentra en mejores condiciones de proporcionar una evaluación más sólida desde el punto de vista técnico y más rigurosa sobre las condiciones de los sitios que la que puede obtenerse mediante una visita a los sitios. Tampoco estaba dispuesto a basarse en los informes exhibidos por los peritos de las Partes sin que sus datos y conclusiones fueran evaluados y confirmados (o no) por un perito independiente.

513. Por consiguiente, el Tribunal ha desestimado la Segunda Solicitud de Desestimación de Perenco[612] y procede ahora a analizar el trabajo del Perito Independiente.

D. El Trabajo del Perito Independiente

1. Calificaciones del Sr. MacDonald

514. El Tribunal observó en el párrafo 47 *supra* que, tras no haber logrado llegar a un acuerdo con respecto a la reconvención ambiental, las Partes acordaron conjuntamente el nombramiento del Sr. Scott MacDonald como Perito Independiente del Tribunal. Las calificaciones del Sr. MacDonald se exponen en su Informe de Perito Independiente, que se adjunta a este Laudo, y no se reiteran aquí. Basta con decir que tiene alrededor de 30 años de experiencia en el asesoramiento de clientes corporativos, el desarrollo de investigaciones multimedia basadas en riesgos y la remediación en virtud de diversos programas regulatorios federales, estaduales y locales a nivel mundial; la realización de distintos tipos de estudios y evaluaciones ambientales, así como la declaración como perito testigo en procedimientos legales y arbitrales, entre otras cosas, sobre el cumplimiento o incumplimiento de obligaciones ambientales, defensas en contra de reclamos de restauración primaria e indemnización de daños compensatorios por aguas subterráneas en procedimientos legales por daños a los recursos naturales; acciones de recuperación de costos de particulares en relación con la fuente, la distribución y el destino de sedimentos

612 El Sr. Kaplan no logra coincidir con la mayoría respecto de esta conclusión. Considera que, en realidad, el Acuerdo Transaccional celebrado entre Burlington y Ecuador libera al otro co-contratista, es decir, Perenco.

del suelo y contaminación de aguas subterráneas; tanques de almacenamiento subterráneo; acciones de recuperación de costos en virtud de la legislación estadounidense y controversias en materia de cobertura de seguros. Gran parte de su trabajo ha involucrado al sector petrolero[613]. Por último, si bien no había trabajado anteriormente en Ecuador, el Sr. MacDonald tiene experiencia en gran parte de América Latina.

2. Alcance del Informe del Perito Independiente

515. El 19 de diciembre de 2018, el Sr. MacDonald emitió su Informe de Perito Independiente Confirmó que él era y seguía siendo independiente de las Partes y también confirmó que el alcance de su trabajo estaba sujeto a la Decisión Provisional sobre la Reconvención[614].

516. A continuación, se incluye una síntesis del Informe del Perito Independiente que expone la descripción del Perito Independiente de su trabajo, sus conclusiones, y los preceptos de remediación en aras de brindar el contexto necesario para el debate del Tribunal sobre los comentarios y las críticas de las Partes referidos al Informe del Perito Independiente y las conclusiones del Tribunal. La síntesis siguiente del Informe del Perito Independiente es solo eso; no debe hacerse inferencia alguna de la tarea del Tribunal de extraer y reproducir aquello que considera los principales puntos planteados por el Perito Independiente. El Informe debe leerse como un todo y constituye una declaración autorizada de la opinión del Perito, complementada por su presentación y testimonio durante el curso de la Audiencia Pericial .

517. El Sr. MacDonald comenzó su Informe explicando que su trabajo consistía en resolver determinadas cuestiones fundamentales sobre la base del alcance de la contaminación ambiental compensable, si la hubiera, en los Bloques 7 y 21, determinada de conformidad con las conclusiones expresadas por el Tribunal en su Decisión Provisional sobre la Reconvención y las aclaraciones del Tribunal en cuanto a su mandato.

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613 Informe del Perito Independiente, pág. 2.

614 *Id.*

518. A tal efecto, revisó en primer lugar lo que habían hecho los peritos de las Partes, identificó lo que consideraba lagunas de datos considerables que requerían solución y, en la medida que encontró contaminación en el muestreo llevado a cabo en los sitios que los peritos de una o ambas de las Partes habían identificado previamente como contaminados, estimó el costo de remediación basado en la conclusión del Tribunal de que debían emplearse las estimaciones de costos internas[615]. Su Informe de Perito Independiente describe el material documental que le proporcionaron tanto el Tribunal como las Partes[616]. Esto fue complementado por visitas a sitios representativos en noviembre de 2016, y nuevamente durante el trabajo de campo realizado en el otoño de 2017[617]. Por último, bajo sus instrucciones, Ramboll generó información y análisis independientes en aras de subsanar lagunas de datos considerables en la investigación de suelos y generó un conjunto de datos válidos desde el punto de vista técnico en reemplazo de la información en materia de aguas subterráneas reunida anteriormente por las Partes. Ramboll realizó además el trabajo necesario para documentar que las piscinas de lodo utilizadas previamente por Perenco cumplían con las regulaciones aplicables de Ecuador[618]. El Sr. MacDonald describió cómo se tomaron sus muestras, cómo se manejaron y adónde se enviaron a fin de que fueran analizadas por un laboratorio calificado[619].

519. El Sr. MacDonald aseveró que su intención consistía en complementar el trabajo existente realizado por los peritos de las Partes en cumplimiento conservador de las leyes y regulaciones de Ecuador de modo de establecer una plataforma técnica más confiable en sustento de la decisión del Tribunal en esta materia[620]. Tal como instruyera el Tribunal, su trabajo técnico se limitó a lo siguiente[621]:

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615 Sección 1.3 del Informe del Perito Independiente, pág. 2.

616 Enumerado en la Sección 8.0 del Informe del Perito Independiente.

617 Sección 1.5 del Informe del Perito Independiente, pág. 4.

618 Sección 1.3 del Informe del Perito Independiente, pág. 2.

619 Apéndices D y E del Informe.

620 Informe del Perito Independiente, pág. 5

621 *Ibid.*, pág. 4

(a) Investigación en sitios en los que ocurrió lo siguiente: (i) una o ambas Partes identificaron contaminación del suelo por encima de los criterios de remediación aplicables conforme a las regulaciones de Ecuador; (ii) las Partes investigaron las aguas subterráneas anteriormente; y (iii) había piscinas de lodo que se determinó que habían sido utilizadas por Perenco;

(b) Respecto de los suelos, la investigación se limitó a áreas evaluadas previamente por una o ambas Partes, cuando la información existente no era suficiente para desarrollar una estimación de costos de remediación válida desde el punto de vista técnico;

(c) Respecto de las aguas subterráneas, la investigación se limitó a sitios en los que el muestreo de aguas subterráneas había sido realizado anteriormente por las Partes, pero en los que se necesitaban metodologías de investigación más sólidas desde el punto de vista técnico. El objetivo del trabajo del Sr. MacDonald consistía en confirmar la presencia o ausencia de contaminación de aguas subterráneas en estos sitios utilizando métodos de instalación y muestreo de pozos más avanzados y aceptados. El Tribunal no solicitó la delineación de la contaminación de aguas subterráneas, que excedía el alcance de esta tarea; y

(d) Respecto de las piscinas de lodo, la investigación se limitó a las piscinas de lodo que se determinó que se habían utilizado durante las operaciones de Perenco.

520. El Sr. MacDonald consideró que su trabajo fue suficiente para acotar considerablemente el rango de posibles costos de limpieza ambiental en el sitio. Aunque quedaban algunas incertidumbres, afirmó que había intentado reducir el grado de estas incertidumbres[622]. Consideró que sus estimaciones de costos de ingeniería son tanto susceptibles de implementación a nivel local como técnicamente viables.

521. El Informe del Sr. MacDonald, Perito Independiente fue enviado a las Partes para que lo revisaran y efectuaran los comentarios pertinentes. Los párrafos siguientes pretenden

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622 *Id.*

ofrecer una síntesis de los puntos destacados en el Informe del Perito Independiente del Tribunal.

3. Evaluación de Información de Línea Base

522. El Sr. MacDonald confirmó la opinión del Tribunal según la cual, a pesar del trabajo realizado por los peritos de las Partes, quedaba bastante incertidumbre acerca de las condiciones de los sitios y, a su juicio, esto era atribuible en gran medida a los propósitos filosóficos diferentes del trabajo del perito, así como a sus enfoques técnicos respecto de la obtención y el procesamiento de datos. Su Informe identificó las cuestiones más significativas del siguiente modo.

523. Los peritos de las Partes adoptaron distintos enfoques respecto de sus análisis. En su opinión, IEMS intentó reflejar lo que denominó un "proceso de diligencia debida del tipo similar al de ASTM" [Traducción del Tribunal], a través del cual podían identificarse posibles áreas de interés ambiental mediante la revisión de documentación proporcionada por las Partes u otras fuentes de información; entrevistas con representantes de las Partes, personal de los sitios con conocimiento de las actividades históricas de los sitios (en la actualidad con Petroamazonas) y miembros de la comunidad local; e inspecciones de los sitios. Se realizó un muestreo de seguimiento en áreas seleccionadas a efectos de evaluar si había contaminación en áreas identificadas previamente como CARs[623]. Cuando se identificaba contaminación (definida por IEMS como por encima de sus valores de base), los datos reunidos por vía del método IDW se modelaban a fin de obtener un estimado del alcance de la contaminación[624].

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623 ASTM (E 1527-05, citado por IEMS) define una CAR como "[l]*a presencia o probable presencia de cualquier sustancia peligrosa o productos de petróleo en una propiedad bajo condiciones que indiquen una liberación existente, un derrame en el pasado, o una amenaza de liberación de material de cualquier sustancia peligrosa o productos de petróleo en las estructuras de la propiedad o en el suelo, agua subterránea, o agua superficial de una propiedad. El término incluye substancias peligrosas o productos de petróleo incluso bajo condiciones de cumplimiento con las leyes. El término no intenta incluir las condiciones mínimas que generalmente no presentan una amenaza a la salud pública o al ambiente o que generalmente no podrían ser sujetas a acciones si se pusieran en conocimiento de las agencias gubernamentales apropiadas. Condiciones determinadas como mínimas no son condiciones ambientales reconocidas*".

624 Informe del Perito Independiente, págs. 32-33.

524. El trabajo de GSI, por otro lado, estaba destinado a evaluar la validez de las conclusiones de IEMS. GSI realizó sus propias inspecciones de los sitios para confirmar y/o identificar nuevas áreas de posible impacto, llevó a cabo otras actividades de caracterización con respecto a las aguas subterráneas, y utilizó técnicas de delineación de la contaminación del suelo, al igual que herramientas de evaluación de riesgos para la salud humana, a efectos de evaluar las conclusiones de IEMS. En opinión del Sr. MacDonald, la tarea de GSI fue más similar a una investigación correctiva, en la que se procedió a la delineación de áreas de contaminación limitadas y previamente identificadas.

525. El Sr. MacDonald concluyó que, en el caso de ambos peritos, las "elecciones técnicas de las Partes, deliberadas o no, estaban sesgadas en cuanto a sus conclusiones"[625]: IEMS sobrestimó muy considerablemente la contaminación real en los sitios mientras que GSI la subestimó[626]. Esto coincidía con la propia opinión que el Tribunal expresara en la Decisión Provisional sobre la Reconvención.

526. Ello resultó en una caracterización incompleta de los sitios y en conclusiones radicalmente diferentes. El Sr. MacDonald analizó cómo afectaba esto a los peritos: (i) prácticas de investigación de sitios (analizadas en la Sección 2.5.2 del Informe); (ii) técnicas de evaluación de datos (analizadas en la Sección 2.5.4 del Informe); y (iii) enfoques respecto de la estimación de costos (analizados en la Sección 2.5.5 del Informe).

527. A fin de evaluar estos métodos y los resultados que arrojaron, el Sr. MacDonald revisó la Decisión Provisional del Tribunal sobre la Reconvención y extrajo las conclusiones principales en relación con los estándares ambientales ecuatorianos que debían aplicarse. Su síntesis de las conclusiones pertinentes se encuentra en la sección 3 de su Informe de Perito Independiente.

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625 *Ibid.*, pág. 11. [Traducción del Tribunal]

626 *Ibid.*, págs. 11 & 12.

528. También tomó nota de las conclusiones del Tribunal acerca de los cambios introducidos en el régimen legal ecuatoriano en lo que respecta a los cambios que la Constitución introdujo en el régimen de responsabilidad basado en la culpa[627].

4. La Cuestión del Uso del Suelo

529. El Sr. MacDonald observó que el Tribunal rechazó la afirmación de Ecuador según la cual debían satisfacerse condiciones de fondo naturales como objetivo de remediación en los sitios y por lo tanto dio instrucciones acerca de qué criterios numéricos debían aplicarse. En el caso de los suelos, dichos criterios dependieron del uso del suelo del área que se había estudiado. Las bases sobre las que se determinó el uso del suelo y los criterios utilizados para clasificar este último se exponen *infra*.

(a) Designaciones del Uso del Suelo

530. Ni el RAOHE ni el TULAS brindaban orientación clara en cuanto a la mejor forma de identificar los criterios de uso del suelo aplicables a un sitio en particular. GSI evaluó 20 proyectos de remediación en campos petrolíferos ubicados en el Oriente operados por Petroecuador, Petroproducción y otros operadores, que demostraron que, en entre el 80 y el 90% de los casos revisados, los criterios de uso del suelo agrícola eran aplicados[628].

531. GSI consideró que IEMS había aplicado los criterios de ”ecosistema sensible” muy ampliamente. El RAOHE define los criterios de ecosistema sensible como “[v]*alores límites permisibles para la protección de ecosistemas sensibles tales como Patrimonio Nacional de Áreas Naturales y otros identificados en el correspondiente Estudio Ambiental*”. Estos se describen con mayor detalle del siguiente modo:

(i) **Patrimonio Nacional de Áreas Protegidas** – en virtud de los Artículos 66 y 67 de la Ley Forestal y de Conservación de Áreas Naturales y Vida Silvestre o “LFCANVS” ciertas áreas se encuentras expresamente designadas y ubicadas en el

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627 *Ibid.*, punto 5 de la Sección 1.6.1

628 *Ibid.*, nota al pie 112.

mapa para ser protegidas por su flora y fauna, o porque constituyen ecosistemas que contribuyen a mantener el equilibrio del medio ambiente[629]. Los límites de estas áreas protegidas incluyen las plataformas Payamino 1/CPF, Payamino 2/8, Payamino 4 y 14/20/24, Payamino 18, Payamino 19, Payamino 23, Waponi-Ocatoe y Nemoca o se encuentran en su proximidad inmediata[630].

(ii) **Estudio Ambiental** – el Artículo 33 del RAOHE indica que los Estudios de Impacto Ambiental (EIA) pueden incluir, entre otros, un Diagnóstico Ambiental - Línea Base, Auditorías Ambientales y Exámenes Especiales, que se define en virtud de la Ley de Gestión Ambiental como un procedimiento administrativo de carácter técnico que tiene por objeto determinar obligatoriamente y en forma previa, la viabilidad ambiental de un proyecto, obra o actividad pública o privada.

532. De conformidad con el Artículo 3.1 del RAOHE, el Diagnóstico Ambiental - Línea Base, de existir, serviría de parámetro para la identificación de las áreas sensibles propias de los sitios. La sección 3.2.2 del Artículo 41 del RAOHE requiere la identificación de ecosistemas terrestres, cobertura vegetal, fauna y flora, ecosistemas acuáticos o marinos, zonas sensibles, especies de fauna y flora únicas, raras o en peligro y potenciales amenazas al ecosistema. No se brinda más orientación respecto de los ecosistemas sensibles[631].

(b) Criterios Seleccionados para Clasificar el Uso del Suelo

533. El Sr. MacDonald determinó que, respecto de la mayoría de los sitios analizados, las evaluaciones de línea base no se encontraban disponibles o no proporcionaban información suficiente para determinar si el sitio se encontraba ubicado en un ecosistema sensible[632]. Observó que el Tribunal instruyó que, debido a la importancia del ecosistema de selva

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629 *Ibid.*, nota al pie 113: http://www.ambiente.gob.ec/areas-protegidas-3/

630 *Ibid.*,nota al pie 114: IDEC, párr. 494 y GSI ER I Apéndices L.23, L.26 y L.29.

631 *Ibid.*, pág. 37.

632 *Id.*

tropical, se debería pecar por exceso de los criterios más protectores[633]. A efectos de evaluar los resultados de muestreo, aplicó entonces los siguientes lineamientos:

(a) Se revisaron los usos del suelo identificados en la Decisión Provisional sobre la Reconvención y los documentos proporcionados por las Partes. En la mayoría de los casos, las observaciones de Ramboll fueron, por lo general, consistentes con las de las Partes. Ramboll se basó en sus propias observaciones en lugar de la documentación presentada por otros; no obstante, el Sr. MacDonald señaló que en ninguno de los casos hubo conflicto entre las observaciones de Ramboll y la determinación de una de las autoridades ecuatorianas identificada.

(b) Se aplican criterios industriales dentro de los límites de las plataformas existentes o las CPF que contienen equipos de procesamiento, pozos operativos o pozos abandonados que podrían ponerse nuevamente en servicio. Las áreas operativas que contienen otra infraestructura en uso (por ejemplo, estaciones de transferencia de desechos, áreas de tratamiento de suelos, estaciones de bombeo de combustible) también se consideraron industriales. Por lo general, las áreas de estas plataformas se definen mediante vallado y/o cunetas perimetrales.

(c) Los suelos que no se encuentran sobre las plataformas se consideraron potencialmente accesibles para el público, el ganado y la vida silvestre. Por lo tanto, dichas áreas están sujetas a criterios no industriales más estrictos (es decir, ecosistema sensible/residencial o agrícola). En cuanto a las piscinas de lodo ubicadas fuera de los límites de las plataformas, se supone que se consideró que los centímetros de material se encontraban biodisponibles y que tenían los mismos usos del suelo que los suelos adyacentes. Los criterios comerciales, por lo general, no eran aplicables a los sitios y no se incluyen en su trabajo.

633 IDEC, párr. 495.

(d) Los criterios agrícolas serían aplicables dentro de áreas despejadas, pasturas abiertas o áreas que se encontraban bajo cultivo activo. Los criterios agrícolas también serían aplicables a áreas que se utilizan claramente para la ganadería.

(e) Los criterios residenciales y de ecosistema sensible serían aplicables a todos los demás suelos, incluidos los siguientes:

(i) Parques y suelos de preservación designados;

(ii) Propiedades residenciales;

(iii) Bosques primarios, bosques secundarios y pasturas abiertas que no parezcan ser muy usadas por el ganado;

(iv) Suelos anteriormente cultivados que estén sin explotar o suelos que contengan cultivos nativos y rellenados, y/o plantas nativas que sean cosechadas; y

(v) Plataformas que hayan sido abandonadas o cuyo cierre se encuentre programado[634].

534. El propósito de la aplicabilidad muy amplia de los criterios de ecosistema sensible consistía en facilitar la restauración de suelos que podrían haberse visto afectados por actividades de extracción de petróleo, pero que gozan del amparo de la Constitución ecuatoriana de 2008. También se consideró que esta aplicación respondía a la dependencia de los residentes locales respecto del ambiente natural a fin de obtener alimentos.

535. Cuando algunos parámetros se encontraban naturalmente en concentraciones que superaban los criterios aplicables más estrictos (sean agrícolas o de ecosistema sensible/residenciales), de conformidad con la normativa ecuatoriana, se aplicarían los "criterios de fondo" (para la discusión más detallada, véase la Sección 3.1.2.1 y el Apéndice C del Informe del Perito Independiente del Tribunal)[635].

634 Informe del Perito Independiente, pág. 38

635 *Id.*

5. Estándares de Remediación

536. Los estándares de remediación aplicables al suelo, piscinas de lodo, y aguas subterráneas están definidos en el TULAS y el RAOHE. En el caso de suelos, los criterios de remediación publicados se definen en función del uso específico del suelo del área estudiada y consideran el desarrollo de criterios de fondo respecto de los cuales las condiciones de línea base indican la presencia natural de componentes regulados por sobre el criterio publicado. El criterio numérico para todos los medios se describe en la Sección 3.2 del Informe del Perito Independiente[636] .

6. Selección de Parámetros Analíticos

537. En función de las conclusiones del trabajo previo, y el conjunto de parámetros analíticos seleccionados por el propio equipo de consultoría de Ecuador[637], los compuestos evaluados por el Sr. MacDonald en los Bloques están descritos en la Tabla 3.4 de su Informe[638]. A saber:

Tabla 3.4: Contaminantes seleccionados que suscitan preocupación

Analito	Suelos	Lodo	Agua subterránea	Observaciones
TPH	X	X	X	Los TPH representados por la suma de GRO, DRO y MRO (véase Sección 3.1.6).
HAP	-	X	-	Las Partes evaluaron inicialmente la presencia de HAP en suelos y aguas subterráneas pero no se hallaron niveles que suscitaran preocupación y no fueron considerados en trabajos posteriores .
Bario	X	X	X	Las Partes evaluaron la presencia de Ba en todos los medios.
Cadmio	X	X	X	Las Partes evaluaron la presencia de Cd en todos los medios.
Cromo	X	X	X	Las Partes evaluaron inicialmente la presencia de Cr en el suelo pero luego no fue considerado en etapas de estudio subsiguientes porque “no se detectaron niveles relevantes de concentración de dicho

636 Véase el Informe del Perito Independiente, Tabla 3.1 para suelos, Tabla 3.2 para piscinas de lodo, y Tabla 3.3 para aguas subterráneas.

637 Informe del Perito Independiente, pág. 44 y notal al pie 123, que hace referencia a IEMS, 2011, pág. 31.

638 *Ibid.*, págs. 44 y 45. [Traducción del Tribunal]

Tabla 3.4: Contaminantes seleccionados que suscitan preocupación				
Analito	Suelos	Lodo	Agua subterránea	Observaciones
				componente". [Traducción del Tribunal] Sin embargo, se retuvo el Cr porque es un compuesto necesario para los ensayos de degradación en las piscinas de lodo, fue incluido en el conjunto original de componentes de aguas subterráneas, y se había encontrado por sobre los estándares numéricos de remediación aplicables en diversas muestras de suelo.
Cobre	-	-	X	Las Partes no analizaron la presencia de Cu en el suelo y el RAOHE no lo exige para los materiales de las piscinas de lodo; pero fue analizado por las Partes en aguas subterráneas.
Plomo	X	-	X	El RAOHE no exige el análisis de Pb para materiales de piscinas de lodo.
Níquel	X	-	X	El RAOHE no exige el análisis de Ni para materiales de piscinas de lodo.
Vanadio	X	X	-	No se analizó la presencia de V en aguas subterráneas porque no hay un estándar correspondiente para aguas subterráneas o agua potable; las Partes tampoco analizaron la presencia de este metal en sus trabajos de aguas subterráneas.
Conducti-vidad	-	X	X	No se midieron la conductividad y el pH del suelo porque constituyen solamente parámetros indicadores.
pH	-	X	-	

(a) Parámetros Indicadores

538. En etapas anteriores del procedimiento, el perito de Perenco, GSI, alegó que los únicos parámetros confiables que podrían emplearse para evaluar el impacto de las operaciones en los yacimientos petrolíferos son TPH (crudo), bario (lodo de perforación) y conductividad eléctrica del suelo (agua producida). "*La presencia de otras sustancias químicas en el suelo, en ausencia de un indicador principal (por ejemplo, níquel en ausencia de niveles elevados de bario o TPH), no puede ser originada por material del yacimiento petrolífero y, por lo tanto, no fue conservada para estudios posteriores*"[639]. La

[639] Informe del Perito Independiente, pág. 45 y notal al pie 124, que hace referencia a la Decisión Provisional, párr. 242. [Traducción del Tribunal]

metodología de la delineación de los contaminantes empleada por GSI reflejó dicha opinión; los metales pesados que tampoco se encontraron en presencia de un indicador componente no fueron identificados como contaminantes que exigieran una descripción y/o remediación adicional, y no fueron estudiados.

539. En opinión del Sr. MacDonald, el TPH, el bario y la conductividad constituyen indicadores útiles que, en el caso de que sean elevados, sugieren un posible impacto ambiental como resultado de las operaciones petroleras. Sin embargo, los metales pesados pueden asociarse también con las operaciones de perforación de pozos, la extracción de crudo y/o la gestión de aguas de formación. Si bien Perenco afirmó que estas aguas de formación se habían reinyectado, existe la posibilidad de que dicho material haya sido vertido durante su almacenamiento, transporte y manipulación. Por lo tanto, y debido a las operaciones petroleras, no puede descartase por completo la presencia de metales pesados en los suelos a niveles que excedan los valores de fondo. Dicho esto, en los casos en los que se hallaron metales en ausencia de bario o TPH se consideró apropiado prestar especial atención a la determinación de si es más probable que las detecciones sean atribuidas a las actividades en los yacimientos petrolíferos o a las condiciones naturales de los valores de fondo[640].

(b) Conductividad y pH

540. El Sr. MacDonald coincidió con IEMS y GSI respecto de que era de poca utilidad el uso de la conductividad o el pH como parámetros para determinar la presencia o el grado de contaminación de los suelos. La conductividad eléctrica y el pH fueron incluidos en el análisis de los materiales de las piscinas de lodo (tal como exige el RAOHE)[641].

7. Análisis

(a) Selección del Laboratorio y el Método

541. El Sr. MacDonald explicó que la selección del laboratorio para este proyecto fue una tarea compleja debido a la limitada disponibilidad de instalaciones locales adecuadas que

640 *Ibid.*, págs. 45 y 46.

641 *Ibid.*, pág. 46.

pudieran completar todos los ensayos necesarios, y que, asimismo, resultaran satisfactorias para ambas Partes. Finalmente, ALS Environmental - con sede en Houston, Texas - fue elegido por sus certificaciones, por el hecho de tener una oficina en Ecuador que podría contribuir al manejo y gestión de las muestras, y por su capacidad para gestionar el traslado de las muestras desde los sitios hasta su laboratorio en Houston.

542. El Sr. MacDonald procuró garantizar que el método de selección se asemejara todo lo posible a aquellos métodos que Ecuador estableció en el Anexo 5 del RAOHE y en el TULAS. Sin embargo, observó que en ciertas ocasiones los métodos de laboratorio contemplados en las regulaciones estaban desactualizados. Por lo tanto, seleccionó alternativas que, a su juicio profesional, eran apropiadas. Los Apéndices D y E de su Informe ofrecen detalles de los procedimientos de gestión de las muestras y los métodos de análisis empleados en su trabajo.

(b) Hidrocarburos Totales de Petróleo

543. Además, el Sr. MacDonald consideró los métodos seleccionados para los THP a ser utilizados en este sitio ya que los métodos establecidos en el Anexo 5 del RAOHE fueron desestimados ampliamente y no son de uso profesional en la actualidad[642]. Las Partes utilizaron dos métodos posiblemente adecuados en sus estudios: IEMS utilizó el Método 1005 de la Texas Natural Resources Conservation Commission (TNRCC), mientras que GSI utilizó el SW846 8015C para muestras de suelo y aguas subterráneas y el Método 1006 de la TNRCC para muestras de suelo. En consulta con el laboratorio, el Sr. MacDonald prefirió utilizar el SW846 8015C para el análisis de GRO (C6-C10), DRO (C10-C28) y ORO (C20-C35), para que las posibles fuentes de petróleo pudieran ser evaluadas de mejor

642 *Ibid.*, pág. 46 y nota al pie 126: se hizo referencia a los siguientes métodos y publicaciones en el Anexo 5 del RAOHE, pero no fueron seleccionados por diversos motivos: (a) 6/1997 ECY 97-602 no es un método, sino que constituye una publicación que sintetiza varios métodos para TPH; (b) EPA 413.1 se utiliza para mediciones de petróleo y lubricantes, no para TPH; (c) EPA 418.1, que era aplicable para TPH, fue desestimado por la USEPA en 2007 debido al uso de Freón 113 como solvente; (d) el método 1664 (SGT-HIEM) se emplea para la medición de petróleo y lubricantes, no de TPH; (e) ASTM D3921-96 fue desestimado por la ASTM en 2013, y no fue sustituido debido a su uso limitado en la industria; y (f) el estándar alemán DIN 38409-H18 no se emplea en la actualidad.

manera[643]. Con el propósito de comparar de forma adecuada los resultados con los estándares, decidió sumar estas fracciones para obtener el valor total de TPH. Esta técnica tiene la potencialidad de incrementar la concentración informada de TPH en la muestra debido a la superposición de carbonos entre dichas fracciones. No obstante, y a juicio profesional del Sr. MacDonald, este constituyó un enfoque razonable y conservador.

(c) Metales

544. Todas las muestras de degradación de suelo, aguas subterráneas y piscinas de lodo fueron analizadas para determinar la presencia de metales por medio del Método SW6020A de la USEPA (Agencia de Protección Ambiental de los Estados Unidos). De forma consistente con los análisis previos llevados a cabo por los peritos de las Partes, sólo se analizaron los siguientes metales: Bario, Cadmio, Cromo, Cobre, Plomo, Níquel, Vanadio y Zinc.

545. El RAOHE especifica una cantidad de métodos de absorción atómica para el análisis de metales. En opinión del Sr. MacDonald, IEMS utilizó dichos métodos para el análisis de metales de forma consistente con el RAOHE. Respecto de TPH, Ecuador permite sustituir los métodos enumerados en el Anexo 5 por métodos equivalentes de análisis de metales. Por su parte, GSI utilizó para todos los metales el método 6010B - espectrometría de emisión atómica de plasma acoplado inductivamente. El método 6020A elegido por Ramboll - también llevado a cabo por medio de espectrometría de masa con plasma acoplado inductivamente - era similar al que GSI había seleccionado. Todos los métodos empleados por los peritos de las Partes y Ramboll podrían considerarse aceptables y equivalentes conforme al RAOHE.

546. El TULAS no identifica métodos específicos, sino que establece que deberían ser consistentes con aquellos dispuestos por el Instituto Ecuatoriano de Normalización, la ASTM o la USEPA.

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643 Informe del Perito Independiente, pág. 46 y nota al pie 127: los rangos de carbono pueden variar mínimamente; aquellos que se enumeraran en el texto fueron obtenidos de la ficha técnica "Petroleum Hydrocarbon Ranges" presentada por ALS, el laboratorio utilizado para este trabajo.

(d) Ensayos de Degradación

547. El Sr. MacDonald sometió a los análisis TCLP y SPLP (EPA SW-846 1311 y 1312, respectivamente) para las muestras de piscinas de lodo. Luego, la degradación generada sería analizada para determinar los parámetros exigidos por la Tabla 7 del RAOHE: TPH, Bario, Cadmio, Cromo total y Vanadio mediante el uso de los métodos analíticos descritos *supra*; y HAP, por medio del Método 8270D de la USEPA.

(e) Ensayos Geotécnicos

548. Como parte de la instalación de pozos de monitoreo, el equipo del Sr. MacDonald obtuvo muestras de suelo a partir del intervalo analizado en las zonas acuíferas a los efectos del análisis de tamizado e hidrometría empleado para definir el porcentaje de arcilla conforme a los Métodos de la ASTM, y D6913 y D7928, respectivamente. (El RAOHE y el TULAS no especifican métodos de ensayos geotécnicos).

8. Limitación del Alcance y Análisis del Sitio

(a) Consideraciones Fundamentales del Alcance

549. El Sr. MacDonald observó que el Tribunal le ordenó realizar los muestreos adicionales del suelo, de aguas subterráneas y piscinas de lodo en los Bloques que fueran necesarios para determinar la presencia y/o el grado de contaminación para el cual se exige remediación. Luego, se limitó el alcance de estas actividades según se indica a continuación[644]:

(i) Se instruyó al Sr. MacDonald que sólo considerara las áreas de los sitios que las Partes habían estudiado previamente. Su estudio no debía incluir el muestreo conforme a nuevas CAR (Condiciones Ambientales Reconocidas) que él pudiera haber identificado de forma independiente, o conforme a CAR identificadas por las Partes con anterioridad que no hubieran sido objeto de muestreo.

(ii) El Tribunal autorizó un único programa de muestreo. Así, no se implementó un enfoque de muestreo de múltiples etapas que podría haber sido más común para

644 Informe del Perito Independiente, pág. 49.

delinear la contaminación. Por lo tanto, el Sr. MacDonald decidió que mediante el uso de un enfoque de muestreo "macro", los datos que se podrían obtener de un trabajo de campo servirían también para acotar el grado de contaminación posible en los sitios.

(iii) Además, el Sr. MacDonald procuró identificar datos usables que fueron generados en trabajos previos realizados por las Partes para evitar duplicaciones innecesarias.

(iv) Asimismo, determinó que no era necesario delinear cada uno de los puntos en los que se observara contaminación en suelos por sobre los estándares. En algunos casos, y según su opinión, los datos disponibles y otros factores (por ejemplo, la topografía) resultaban suficientes para estimar de forma razonable los valores de remediación aunque no se delinearan totalmente en todas las direcciones. En otras circunstancias, los datos disponibles sugirieron que era probable que el "exceso" no guardara relación con la contaminación del yacimiento petrolífero sino con las posibles condiciones de los "valores de fondo".

(v) Además, el Sr. MacDonald determinó que era apropiado analizar la totalidad del conjunto de metales en cada una de las muestras en las cuales se había detectado previamente que cualquier metal excedía el criterio aplicado, en lugar de restringir el análisis al exceso específico de metales en cada una de las áreas estudiadas. Si respecto de datos anteriores no se suponía la presencia de TPH, él no llevaba a cabo muestreos de TPH, ni tampoco muestreos de metales si los datos previos sugerían solamente la presencia de hidrocarburos.

(b) Análisis del Sitio

550. Ramboll revisó todos los datos obtenidos por las Partes a los efectos de desarrollar un programa de muestreo para los Bloques 7 y 21. El Sr. MacDonald señaló que la consideración fundamental de este ejercicio radicaba en determinar el criterio de análisis apropiado respecto de lo siguiente: (i) los sitios seleccionados para muestreos adicionales; (ii) los análisis de datos para diversos medios o características, incluso suelos, aguas subterráneas y piscinas de lodo; y (iii) los fundamentos y los valores de fondo para el

enfoque del estudio en el sitio adicional[645]. Ello fue considerado apropiado, junto con el ejercicio del juicio y experiencia profesional de Ramboll, para analizar aquello que denominó "*diferencias significativas en la generalidad de los análisis técnicos*" realizados por los peritos de las Partes [Traducción del Tribunal].

551. Un total de 69 sitios quedaron sujetos a un "*análisis de escritorio*"[646]. El análisis incluía la consideración de lo siguiente:

(a) El criterio numérico definido en el RAOHE o, en su ausencia, el TULAS para usos de suelo irrestricto, agrícola e industrial;

(b) Nueva evaluación de la determinación que las Partes hicieran respecto del uso del suelo;

(c) Ubicación y cantidad de los pozos de monitoreo temporarios instalados previamente por las Partes;

(d) El uso histórico de las piscinas de lodo por parte de Perenco; y

(e) La naturaleza de las reclamaciones realizadas en representación de Ecuador.

552. El análisis inicial derivó en la propuesta de un plan de trabajo que identificó 38 sitios para estudios complementarios, incluso 30 sitios en los cuales se debían estudiar los suelos, 14 sitios en los cuales se debían estudiar las aguas subterráneas y 9 sitios en los cuales se debían estudiar las piscinas de lodo. Luego, el Sr. MacDonald excluyó lo siguiente de su plan de trabajo original[647]:

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645 *Id.*

646 Informe del Perito Independiente, nota al pie 129: el Sr. MacDonald utilizó el total de 70 sitios presentados en la estimación de costos de IEMS; sin embargo, Coca 2 y Coca CPF fueron considerados como un único sitio. [Traducción del Tribunal]

647 *Ibid.*, págs. 49 y 50.

(a) Se excluyeron 21 sitios de la consideración correspondiente porque no se plantearon reclamaciones en materia de daño respecto a ellos[648];

(b) Se excluyeron ocho sitios adicionales porque no había: (i) reclamaciones en materia de aguas subterráneas; (ii) pruebas del uso de piscinas de lodo presentadas por Perenco; y (iii) muestras de suelo que contuvieran niveles de contaminación que excedieran los criterios aplicables de limpieza de suelo (con exclusión de la conductividad); y

(c) Se excluyeron ocho sitios adicionales porque: (i) la delineación de los contaminantes era incompleta; o (ii) sólo se detectaron superaciones de límites marginales de un único contaminante.

553. Como resultado de consultas adicionales con las Partes, se extendió la evaluación del análisis inicial para incorporar otros hechos y conclusiones. Los resultados finales de la evaluación del análisis se presentan en las sub-secciones *infra*.

(i) Sitios Excluidos de Consideraciones Adicionales

554. Algunos sitios identificados por GSI e IEMS no requirieron ningún estudio complementario en virtud de los resultados de los trabajos previos de las Partes. Los siguientes sitios no requirieron ensayos adicionales para ningún medio[649]:

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[648] *Ibid.*, nota al pie 130: "si bien varios sitios fueron incluidos en la reclamación financiera inicial de IEMS (por sobre los "valores de fondo"), algunos sitios fueron excluidos de su reclamación, en última instancia, en virtud de la aplicación del criterio regulatorio. Ramboll había descartado inicialmente todos estos sitios de futuros estudios. Durante la implementación del estudio, Ecuador indicó a Ramboll que era probable que algunas muestras de suelo obtenidas en los sitios respecto de los cuales no se habían planteado reclamaciones en materia regulatoria hayan excedido el criterio regulatorio (véase Apéndice B). En consecuencia, Ramboll analizó nuevamente dichos sitios y, cuando fue pertinente, extendió nuestro programa para incluir sitios o áreas de sitios que inicialmente se habían omitido en el programa de muestreo (por ejemplo, Oso A)" [Traducción del Tribunal].

[649] *Ibid.*, Tabla 4.1. [Traducción del Tribunal]

Tabla 4.1 – Sitios Omitidos en el Estudio de Ramboll			
Bloque	Sitio	Reclamación de IEMS (en millones de USD)[1]	Fundamentos[2]
CPUF	Coca 7	0	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
CPUF	Coca 11	1,8	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
CPUF	Coca 12	1,0	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
CPUF	Coca 13	8,2	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
CPUF	Coca 15	11,0	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
7	Gacela 3	0	Reclamación de IEMS condicionada al cierre de pozos petroleros (USD 0,5 millones); sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
7	Gacela 6,9	0	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
7	Lobo 2	0	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
7	Mono 10/12	1,0	Presencia de excesos respecto del suelo condicionada a indicios de concentraciones de bario adyacentes a piscinas de lodo no relacionadas con Perenco; sin muestreos anteriores de aguas subterráneas.
7	Oso 2	0	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
CPUF	Payamino 5	4,9	Presencia de excesos respecto del suelo condicionada a indicios de concentraciones de Vanadio (condiciones de criterios de fondo); sin presencia de piscinas de lodo de Perenco ni muestreos anteriores de aguas subterráneas.

Tabla 4.1 – Sitios Omitidos en el Estudio de Ramboll			
Bloque	Sitio	Reclamación de IEMS (en millones de USD)[1]	Fundamentos[2]
CPUF	Payamino 6	0	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
CPUF	Payamino 9	0	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
CPUF	Payamino 18	0	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
CPUF	Payamino 19	0	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
21	Waponi – Dayuno	12,9	El sitio fue abandonado con anterioridad a las operaciones de Perenco en los Bloques. Las estimaciones de costos de IEMS incluyen la remediación del suelo y aguas subterráneas.
21	Waponi – Ocatoe	2,3	Sin presencia de excesos respecto del suelo, o piscinas de lodo de Perenco. Los muestreos anteriores de las aguas subterráneas indicaron presencia sólo de Zinc por sobre el criterio del TULAS. Como el Zinc no constituye un parámetro de yacimientos petrolíferos, y no había otros medios afectados, este exceso no fue considerado para estudios posteriores.
21	Yuralpa - Puerto Napo	0	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
21	Yuralpa Pad B	0	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
21	Yuralpa – Sumino 1	0,5	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.
CPUF	Coca 7	0	Sin presencia de excesos respecto del suelo, piscinas de lodo de Perenco, o muestreos anteriores de aguas subterráneas.

Observaciones

[1] Valor de la reclamación de IEMS fundada en los criterios regulatorios conforme a las estimaciones de costos en IEMS 2013 presentadas en el Apéndice 35. Se presenta esta información para que el Tribunal tome conocimiento de la magnitud de la posible importancia del sitio respecto de la cuestión en general; estas reclamaciones

Tabla 4.1 – Sitios Omitidos en el Estudio de Ramboll			
Bloque	Sitio	Reclamación de IEMS (en millones de USD)[1]	Fundamentos[2]
no direccionaron la determinación del Sr. MacDonald respecto de la inclusión o exclusión del sitio de una consideración futura. Las reclamaciones no incluyen los costos del cierre de pozos petroleros. [2] "Sin presencia de excesos respecto del suelo" significa que al momento de una nueva evaluación del uso del suelo en los sitios, no se encontraron muestras de suelo que superaran los estándares numéricos de remediación aplicables.			

555. El proceso del análisis de escritorio inicial redujo la cantidad total de sitios de 69 a 49 (aproximadamente un 30% de reducción para los sitios que requerían revisión). La etapa siguiente consistía en identificar el medio ambiental a muestrear en cada uno de los 49 sitios. Las tablas *infra* presentan los fundamentos del Sr. MacDonald para excluir los estudios de suelo, aguas subterráneas y/o piscinas de lodo de determinados sitios en función de su revisión de los datos disponibles.

(ii) Suelos Excluidos de Consideraciones Adicionales

556. La tabla *infra* sintetiza los sitios en los cuales el Sr. MacDonald consideró que era apropiada una evaluación adicional para piscinas de lodo y/o aguas subterráneas, pero en los cuales no eran necesarios ensayos adicionales del suelo. Los fundamentos para la exclusión del suelo se presentan para cada uno de los sitios[650].

Tabla 4.2 – Sitios en los Cuales No Se Realizaron Estudios de Suelo Adicionales					
Bloque	Sitio	Reclamación de Suelo de IEMS)		Reclamación de Suelo Ajustada	Fundamentos [3]
		En millones de USD[1]	% Relacionado con Piscinas de Lodo[2]		
7	Jaguar 9	38,3	0%	38,3	Sin presencia de excesos respecto de los criterios regulatorios para el suelo cuando se procedió con un

650 *Ibid.*, Tabla 4.2. [Traducción del Tribunal]

Tabla 4.2 – Sitios en los Cuales No Se Realizaron Estudios de Suelo Adicionales					
Bloque	Sitio	Reclamación de Suelo de IEMS)		Reclamación de Suelo Ajustada	Fundamentos [3]
		En millones de USD[1]	% Relacionado con Piscinas de Lodo[2]		
					uso correcto del suelo (por ejemplo, criterios industriales sobre plataformas y exclusión de muestras obtenidas del interior de las piscinas de lodo).
7	Lobo 3,5,6,7	3,6	100%	0	Sin presencia de excesos respecto de los criterios regulatorios para el suelo. Reclamación de IEMS restringida al área de piscinas de lodo.
7	Oso 3-7, 13-14	0	0%	0	Sin presencia de excesos respecto de los criterios regulatorios para el suelo. Sitio considerado solamente debido a piscinas de lodo de Perenco.
7	Oso 9,12,15-20	22,3	100%	0	Sin presencia de excesos respecto de los criterios regulatorios para el suelo. Reclamación de IEMS restringida al área de piscinas de lodo.
CPUF	Payamino 13	0	0%	0	Sin presencia de excesos respecto de los criterios regulatorios para el suelo. Sitio considerado solamente debido a ensayos previos de aguas subterráneas.
21	Yuralpa LF	7,8	100%	0	Sin presencia de excesos respecto de los criterios regulatorios para el suelo (todas las muestras anteriores por sobre el criterio de suelo fueron obtenidas de las piscinas de lodo, a pesar de que IEMS atribuyó un 0% a

Tabla 4.2 – Sitios en los Cuales No Se Realizaron Estudios de Suelo Adicionales					
Bloque	Sitio	Reclamación de Suelo de IEMS)		Reclamación de Suelo Ajustada	Fundamentos [3]
		En millones de USD[1]	% Relacionado con Piscinas de Lodo[2]		
					las piscinas en su memorándum).
21	Yuralpa Pad E	2,6	100%	0	Sin presencia de excesos respecto de los criterios regulatorios para el suelo. Reclamación de IEMS restringida al área de piscinas de lodo.
21	Yuralpa Pad G	2,7	100%	0	Sin presencia de excesos respecto de los criterios regulatorios para el suelo. Reclamación de IEMS restringida al área de piscinas de lodo.

Observaciones

[1] La Reclamación de IEMS conforme a los costos de la remediación del suelo fundados en el marco regulatorio informados en EMS 2013, Apéndice 35.

[2] Porcentaje de piscinas de lodo tal como fuera presentado por IEMS en un correo electrónico de fecha 22 de noviembre de 2017 enviado por Gabriela González-Giraldez a Marco Tulio Montañés-Rumayor.

[3] Las muestras de suelo anteriores cumplieron todos los estándares numéricos regulatorios cuando los criterios industriales se aplicaron sobre la plataforma, y los criterios de ecosistema sensible o agrícola se aplicaron fuera de la plataforma, según correspondiera.

557. En opinión del Sr. MacDonald, los sitios indicados *supra* no requerían muestreos adicionales del suelo porque la documentación disponible carecía de pruebas que demostraran que el suelo excedía los criterios regulatorios aplicables más estrictos de Ecuador[651]. La mayoría de las reclamaciones asociadas con los sitios indicados *supra* versaban sobre piscinas de lodo con "superaciones de límites" informadas por IEMS respecto de las muestras de suelo obtenidas dentro de los límites de las piscinas de lodo.

651 *Ibid.*, pág. 53.

(iii)Piscinas de Lodo Excluidas de Consideraciones Adicionales

558. Las plataformas que contienen piscinas de lodo, que deben evaluarse respecto de la integridad física - conforme al estándar de cumplimiento del RAOHE - y contemplan la integridad y calidad del material de recubrimiento fueron seleccionadas en función de lo siguiente: (i) si las piscinas de lodo estaban en un sitio determinado; (ii) si había pruebas de un uso anterior por parte de Perenco fundado en el momento de cierre de las piscinas de lodo (en caso de ser un dato conocido) y la instalación de pozos petroleros de producción (en caso de que las fechas de cierre de las piscinas de lodo no estuvieran disponibles); y (iii) cualquier otra información proporcionada por las Partes, incluso los análisis de los representantes de las Partes en el yacimiento. La evaluación del Sr. MacDonald de las piscinas de lodo asociadas con Perenco fue presentada a las Partes para su confirmación.

559. Además, el Sr. MacDonald revisó la documentación presentada por IEMS relativa al reacondicionamiento de pozos, respecto del cual IEMS había alegado que podría haber derivado en residuos que requirieran ser desechados. No había registros del desecho de estos residuos en el sitio para ninguna de las actividades de reacondicionamiento tal como se describiera en los informes adjuntos; por lo tanto, el Sr. MacDonald no supuso la "re-apertura" de ninguna piscina de lodo para dichas actividades. Asimismo, revisó los datos disponibles de los ensayos de degradación presentados por GSI para determinar si las muestras anteriores y el análisis de los datos conforme a las Tablas 7a/7b del RAOHE habían sido llevados a cabo de forma correcta. Si bien consideró que los ensayos previos eran de cierta utilidad, se requirieron ensayos adicionales en todos los casos para evaluar las condiciones de las piscinas de lodo.

560. Los sitios en los cuales no se propusieron ensayos de las piscinas de lodo son los siguientes[652]:

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652 *Ibid.*, Tabla 4.3. [Traducción del Tribunal]

Tabla 4.3 – Sitios en los Cuales No Se Realizaron Estudios de Piscinas de Lodo Adicionales					
Bloque	Sitio	Reclamación de IEMS sobre Piscinas de Lodo en millones de USD[1]	Instalación de Pozos Petroleros	Fecha de Cierre de Piscinas de Lodo	Fundamentos
CPUF	Coca 1	0	1/1971	n/a	Sin presencia de piscinas de lodo en el sitio.
CPUF	Coca 2, CPF	1,3	12/1988	3/2001	No se identificó uso por parte de Perenco.
CPUF	Coca 4	0	1/1990	6/1997	No se identificó uso por parte de Perenco.
CPUF	Coca 6	0	10/1989	desconocida	No se identificó uso por parte de Perenco.
CPUF	Coca 8	2,3	8/1991	desconocida	No se identificó uso por parte de Perenco.
CPUF	Coca 9	0	1/1993	n/a	Sin presencia de piscinas de lodo en el sitio.
CPUF	Coca 10, 16	0	9/1993	desconocida	No se identificó uso por parte de Perenco.
7	Gacela CPF, 1 y 8	0,7	2/1991	desconocida	No se identificó uso por parte de Perenco.
7	Gacela 2	0	6/1992	2/1998	No se identificó uso por parte de Perenco.
7	Gacela 4	1,3	3/1994	desconocida	No se identificó uso por parte de Perenco.
7	Gacela 5	2	9/1994	desconocida	No se identificó uso por parte de Perenco.
7	Jaguar 1	0	1/1988	desconocida	No se identificó uso por parte de Perenco.
7	Jaguar 2	8,9	12/1988	desconocida	No se identificó uso por parte de Perenco.
7	Jaguar 3	0	1/1994	1/1994	No se identificó uso por parte de Perenco.
7	Jaguar CPF, 5 Camp	0	1/1996	7/1996	No se identificó uso por parte de Perenco.
7	Jaguar 7,8	0	2/1996 6/1996	10/1996	No se identificó uso por parte de Perenco.

Tabla 4.3 – Sitios en los Cuales No Se Realizaron Estudios de Piscinas de Lodo Adicionales					
Bloque	Sitio	Reclamación de IEMS sobre Piscinas de Lodo en millones de USD[1]	Instalación de Pozos Petroleros	Fecha de Cierre de Piscinas de Lodo	Fundamentos
7	Lobo 1	0	2/1989	desconocida	No se identificó uso por parte de Perenco.
7	Mono CPF, 1-5, IW	0	Varias 1989-1997	9/1996	No se identificó uso por parte de Perenco.
7	Mono Sur, 6-9, 11	0	Varias 1996-1997	desconocida	No se identificó uso por parte de Perenco.
7	Oso 1, CPF	0	9/1970	desconocida	No se identificó uso por parte de Perenco.
CPUF	Payamino CPF, 1	0	11/1986 (1) 1992 (CPF)	3/2001	No se identificó uso por parte de Perenco. Las piscinas de lodo del sitio eran utilizadas para agua producida de CPF, no para lodo de perforación.
CPUF	Payamino 2 & 8	0	5/1987 9/1992	desconocida 8/1993	No se identificó uso por parte de Perenco.
CPUF	Payamino 3	2,2	8/1987	desconocida	No se identificó uso por parte de Perenco.
CPUF	Payamino 4	10,9	7/1988	desconocida	No se identificó uso por parte de Perenco.
CPUF	Payamino 14, 20, 24		5/1994 6/1994 5/2001	9/1994 desconocida 12/2001	No se identificó uso por parte de Perenco.
CPUF	Payamino 10	1,7	3/1993	6/1993	No se identificó uso por parte de Perenco.
CPUF	Payamino 13	0	10/1993	desconocida	No se identificó uso por parte de Perenco.
CPUF	Payamino 15	2,0	12/1993	desconocida	No se identificó uso por parte de Perenco.
CPUF	Payamino 21	0	10/1994	n/a	Sin presencia de piscinas de lodo en el sitio (lodo desechado en Payamino 16 IW).

Tabla 4.3 – Sitios en los Cuales No Se Realizaron Estudios de Piscinas de Lodo Adicionales					
Bloque	Sitio	Reclamación de IEMS sobre Piscinas de Lodo en millones de USD[1]	Instalación de Pozos Petroleros	Fecha de Cierre de Piscinas de Lodo	Fundamentos
CPUF	Payamino 23	0,8	5/1997	8/2000	No se identificó uso por parte de Perenco.
CPUF	Punino 1	1,2	12/1990	desconocida	No se identificó uso por parte de Perenco.
21	Waponi - Nemoca 1	0	12/1999	2/2000	No se identificó uso por parte de Perenco.
21	Yuralpa Pad D	0	8/2006	n/a	Dos piscinas de lodo existentes en línea e inutilizadas. Las piscinas de lodo supuestamente contenían lodo/recortes que se habían retirado y transferido a Yuralpa LF.
Observaciones [1] Las operaciones de Perenco en el sitio se llevaron a cabo en el período comprendido entre 9/2002 y 7/2009.					

(iv) Aguas Subterráneas Excluidas de Consideraciones Adicionales

561. El Sr. MacDonald, conforme a las instrucciones del Tribunal, limitó sus actividades de muestreo de las aguas subterráneas a aquellos sitios en los cuales las Partes habían realizado ensayos previos[653]. Además, excluyó tres sitios en los cuales se habían realizado ensayos,

653 *Ibid.*, nota al pie 131: el Sr. MacDonald observa que en la correspondencia de fecha 14 de noviembre de 2017 Perenco planteó algunas cuestiones relativas al enfoque de las aguas subterráneas, incluso asuntos relacionados con las ubicaciones de los pozos de monitoreo y la filtración. Estas cuestiones fueron analizadas en su correspondencia de fecha 28 de diciembre de 2017 (disponible en el Apéndice B de su informe).

pero, en su opinión, no era necesario llevar a cabo ensayos adicionales (dos de estos sitios se omitieron por completo en su programa). Sus motivos para ello fueron los siguientes:

(i) Se excluyó el sitio Waponi-Ocatoe de los estudios adicionales porque los ensayos previos de IEMS habían identificado solamente la presencia de Zinc por sobre el estándar aplicable del TULAS (Zinc en 1,38 mg/l). El Zinc no constituye un contaminante de yacimientos petrolíferos, y ningún otro medio de dicho sitio identificó la posible presencia de contaminantes provenientes de yacimientos petrolíferos.

(ii) Se excluyó por completo el sitio Waponi-Dayuno porque, si bien las aguas subterráneas habían sido muestreadas previamente por IEMS, Perenco nunca había operado en dicha plataforma.

(iii) Solamente IEMS realizó ensayos en el sitio Yuralpa Landfill. GSI había procurado instalar un pozo de prueba en dicho sitio, pero ello fue rechazado antes de encontrar aguas subterráneas. El Sr. MacDonald excluyó este sitio porque era la única zona de aguas subterráneas del Bloque 21 - en virtud de la experiencia de GSI había pocas probabilidades de éxito - y dicha tarea había exigido el traslado de diversos equipos de perforación que no estaban inmediatamente disponibles para dicho Bloque[654].

562. Todos los otros sitios en los cuales las Partes realizaron muestreos de las aguas subterráneas permanecieron en el programa complementario.

(c) Resultado de la Evaluación del Análisis

563. El proceso de análisis de escritorio derivó en la reducción de la cantidad de sitios - de 69 a 49 sitios - en los que era pertinente la realización de estudios de suelo, piscinas de lodo y/o aguas subterráneas. Los sitios y medios que fueron excluidos de las revisiones adicionales estaban asociados con las estimaciones de costos de remediación de IEMS por un importe

654 *Ibid*., pág. 56.

total de USD 119,5 millones, o 13,6% del total de la reclamación en materia regulatoria por un importe de USD 876 millones.

564. La Tabla 4.4 correspondiente al informe del Sr. MacDonald enumera los sitios y medios ambientales que fueron estudiados de forma adicional, así como el importe aproximado de las reclamaciones en materia regulatoria de IEMS asociadas a dichas instalaciones.

Tabla 4.4 – Sitios y Medios Incluidos en los Estudios Complementarios de Ramboll[2]

Plataforma	Medios en el Estudio Complementario			Estimaciones de Costos de Remediación de IEMS (en millones de USD)					% del Total de las Reclama-ciones
	Suelo	Piscinas de Lodo	GW	Suelo	Lodo	GW[1]	Pozos Petroleros	Total	
Coca 1	■			29,7	0,0	0,0	0,0	29,7	*3,39*
Coca 2, CPF	■		■	82,1	1,3	4,6	0,0	88,1	*10,05*
Coca 4	■			3,6	0,0	0,0	0,0	3,6	*0,41*
Coca 6	■			10,0	0,0	0,0	0,0	10,0	*1,14*
Coca 7				0,0	0,0	0,0	0,0	0,0	*0,00*
Coca 8	■			35,9	2,3	0,0	0,0	38,2	*4,37*
Coca 9	■			23,0	0,0	0,0	0,0	23,0	*2,63*
Coca 10, 16	■			0,3	0,0	0,0	0,0	0,3	*0,03*
Coca 11				1,8	0,0	0,0	0,0	1,8	*0,21*
Coca 12				0,1	0,9	0,0	0,0	1,0	*0,12*
Coca 13				8,2	0,0	0,0	0,0	8,2	*0,93*
Coca 15				11,0	0,0	0,0	0,0	11,0	*1,25*
Coca 18, 19	■	■		29,4	4,0	0,0	0,0	33,4	*3,82*
Cóndor N 1	■	■		25,3	2,8	0,0	0,5	28,7	*3,27*
Gacela 1, 8, CPF	■		■	23,2	0,7	4,6	0,0	28,5	*3,25*
Gacela 2	■		■	17,4	0,0	2,3	0,5	20,2	*2,31*
Gacela 3				0,0	0,0	0,0	0,5	0,5	*0,06*
Gacela 4	■			0,0	1,3	0,0	0,0	1,3	*0,15*
Gacela 5	■			0,0	2,0	0,0	0,0	2,0	*0,23*
Gacela 6, 9				0,0	0,0	0,0	0,0	0,0	*0,00*
Jaguar 1	■		■	1,0	0,0	2,3	0,0	3,3	*0,38*
Jaguar 2	■		■	5,3	8,9	2,3	0,5	17,0	*1,94*
Jaguar 3	■			12,0	0,0	0,0	0,0	12,0	*1,37*
Jaguar 5, Camp, CPF	■			0,3	0,0	0,0	0,0	0,3	*0,04*
Jaguar 7, 8	■			38,6	0,0	0,0	0,5	39,1	*4,47*
Jaguar 9		■		38,3	0,0	0,0	0,5	38,8	*4,43*
Lobo 1	■			1,5	0,0	0,0	0,0	1,5	*0,17*
Lobo 2				0,0	0,0	0,0	0,0	0,0	*0,00*
Lobo 3, 5, 6, 7		■		0,0	3,6	0,0	0,0	3,6	*0,41*
Lobo 4	■			0,0	0,0	0,0	0,5	0,5	*0,06*

Tabla 4.4 – Sitios y Medios Incluidos en los Estudios Complementarios de Ramboll[2]									
Plataforma	Medios en el Estudio Complementario			Estimaciones de Costos de Remediación de IEMS (en millones de USD)					% del Total de las Reclama-ciones
	Suelo	Piscinas de Lodo	GW	Suelo	Lodo	GW[1]	Pozos Petroleros	Total	
Mono 1-5, CPF, IW	■		■	103,7	0,0	2,3	0,0	106	*12,11*
Mono Sur, 6-9, 11	■			11,5	0,0	0,0	0,0	11,5	*1,31*
Mono 10, 12				0,0	1,0	0,0	0,0	1,0	*0,11*
Oso 1, CPF	■			22,6	0,0	0,0	0,0	22,6	*2,58*
Oso 2				0,0	0,0	0,0	0,0	0,0	*0,00*
Oso 3-7, 13-14		■		0,0	0,0	0,0	0,0	0,0	*0,00*
Oso 9, 12, 15-20		■	■	0,0	22,3	2,3	0,0	24,6	*2,80*
Oso A, 21, 22, 23	■			0,0	0,0	0,0	0,0	0,0	*0,00*
Payamino 1, CPF	■		■	40,1	0,0	2,3	0,0	42,43	*4,83*
Payamino 2, 8	■		■	31,9	0,0	2,3	0,0	34,2	*3,90*
Payamino 3	■			0,0	2,2	0,0	0,0	2,2	*0,25*
Payamino 4	■		■	34,3	0,0	2,3	0,0	36,6	*4,18*
Payamino 5				4,0	0,9	0,0	0,0	4,9	*0,56*
Payamino 6				0,0	0,0	0,0	0,0	0,0	*0,00*
Payamino 9				0,0	0,0	0,0	0,0	0,0	*0,00*
Payamino 10	■			0,0	1,7	0,0	0,0	1,7	*0,19*
Payamino 13			■	0,0	0,0	2,3	0,0	2,3	*0,26*
Payamino 14, 20, 24	■		■	21,2	10,9	2,3	0,0	34,4	*3,93*
Payamino 15	■		■	0,0	2,0	2,3	0,0	4,3	*0,49*
Payamino 16	■			10,5	2,6	0,0	0,0	13,1	*1,50*
Payamino 18				0,0	0,0	0,0	0,0	0,0	*0,00*
Payamino 19				0,0	0,0	0,0	0,0	0,0	*0,00*
Payamino 21	■			2,0	0,0	0,0	0,0	2,0	*0,22*
Payamino 23	■			0,0	0,8	0,0	0,0	0,8	*0,09*
Payamino LF	■	■		0,0	26,5	0,0	0,0	26,5	*3,02*
Punino 1	■			1,4	1,2	0,0	0,0	2,6	*0,30*

Tabla 4.4 – Sitios y Medios Incluidos en los Estudios Complementarios de Ramboll[2]

Plataforma	Medios en el Estudio Complementario			Estimaciones de Costos de Remediación de IEMS (en millones de USD)					% del Total de las Reclama-ciones
	Suelo	Piscinas de Lodo	GW	Suelo	Lodo	GW[1]	Pozos Petroleros	Total	
Waponi Dayuno				10,6	0,0	2,3	0,0	12,9	*1,47*
Waponi Nemoca 1	■			15,1	0,0	0,0	0,0	15,1	*1,72*
Waponi Ocatoe				0,0	0,0	2,3	0,0	2,3	*0,26*
Yuralpa Chonta	■	■		0,0	1,1	0,0	0,0	1,1	*0,13*
Yuralpa Pad A	■	■		1,7	0,0	0,0	0,0	1,7	*0,19*
Yuralpa Pad B				0,0	0,0	0,0	0,0	0,0	*0,00*
Yuralpa Pad D	■			7,9	0,0	0,0	0,0	7,9	*0,91*
Yuralpa Pad E		■		0,0	2,6	0,0	0,0	2,6	*0,30*
Yuralpa Pad F / CPF	■			0,0	0,0	0,0	0,0	0,0	*0,00*
Yuralpa Pad G		■		0,0	2,7	0,0	0,0	2,7	*0,31*
Yuralpa LF		■		0,0	7,8	2,3	0,0	10,1	*1,16*
Yuralpa Puerto Napo				0,0	0,0	0,0	0,0	0,0	*0,00*
Yuralpa Sumino 1				0,5	0,0	0,0	0,0	0,5	*0,06*
Incluida en el Estudio de Ramboll	41	12	13	USD 642,4	USD 76,1	USD 34,4	USD 3,5	USD 756,4	*86,4%*
Excluida	**28**	**57**	**56**	**USD 74,5**	**USD 38,1**	**USD 6,9**	**USD 0,0**	**USD 119,5**	*13,6%*
Total	**69**	**69**	**69**	**USD 716,9**	**USD 114,2**	**USD 41,3**	**USD 3,5**	**USD 875,9**	*100%*

Observaciones:

[1] Las estimaciones de costos de IEMS para la remediación de aguas subterráneas presentadas en la Tabla 35 de su Informe Pericial de 2013 constituyen estimaciones de costo básicas para aguas subterráneas (USD 2,3 millones por sitio, con las estimaciones correspondientes a Coca 2/CPF y Gacela 1/8/CPF duplicadas para reflejar la designación de sitios con múltiples plataformas). Las estimaciones más complejas de IEMS para aguas subterráneas, incluidas las contingencias, ascendían a USD 13,5 millones para cada sitio. Los informes de IEMS hacían referencia a estos mayores valores, pero no se incluyeron en la Tabla 35, por lo tanto, no fueron incorporados en el presente análisis.

[2] Las celdas resaltadas en azul representan las estimaciones de costos de IEMS que han sido excluidas de las revisiones adicionales (refiérase a las Secciones 4.2.2 y 4.2.3. del informe del Sr. MacDonald). Las filas resaltadas en gris representan los sitios que han sido excluidos de las revisiones adicionales (refiérase a la Sección 4.2.1 del informe).

[Traducción del Tribunal]

9. Resultados de muestreo

565. Los planes de muestreo específicos de los sitios del Sr. MacDonald fueron diseñados para cada sitio y medio que estaban sujetos a consideración tras haber finalizado el análisis. Los principios rectores que rigen a dichos planes se encuentran sintetizados en la Sección 5.1 de su Informe y se exponen con más detalle en los Apéndices D y E de este último.

566. Entre el 19 de septiembre y el 15 de diciembre de 2017, equipos de trabajo se trasladaron a los Bloques 7 y 21 para implementar los planes de muestreo específicos de los sitios bajo la dirección del Sr. MacDonald. A continuación, se expone una síntesis de sus conclusiones.

(a) Piscinas de lodo

Tabla 5.1: Síntesis de las conclusiones del estudio de las piscinas de lodo

Sitio	Piscina de lodo #	Superaciones de límites de los criterios de degradación en las piscinas revestidas					Superaciones de límites de los criterios de material de cobertura aplicables al suelo (Resultados del análisis)				
		Ba	TPH	HAP	pH	Cond	Ba	Cd	Ni	TPH	Criterio
Chonta [1]	1								X		Ind
	5	X		Y	X		X		X		Eco
Coca 18 y 19 [2]	2	X	X	Y							Ind
	3	X		Y							Ind
	4	X			X						Ind
	5	X		X							Ind
	6				X						Eco
Cóndor Norte	1				X						Eco
	2	X					X				Eco
	3						X				Eco
Jaguar 9	1				X		X	X	X		Eco
Lobo 3	1										Ind
	2				X						Ind
Oso 3	1	X					X				Ind
Oso 9 [3]	1	X		X							Ag
	3	X	X	Y							Ag
	5	X	X	Y	X						Ag

Tabla 5.1: Síntesis de las conclusiones del estudio de las piscinas de lodo

Sitio	Piscina de lodo #	Superaciones de límites de los criterios de degradación en las piscinas revestidas					Superaciones de límites de los criterios de material de cobertura aplicables al suelo (Resultados del análisis)				
		Ba	TPH	HAP	pH	Cond	Ba	Cd	Ni	TPH	Criterio
	6			X	X						Ag
	7			Y	X	X	X				Ag
	8										Ag
	9			X		X					Ag
Oso 9A	Área 1				X						Eco
	Área 2				X		X				Eco
	Área 3				X		X				Eco
	Área 4	X					X				Eco
Oso 9B	Área 1	X			X		X				Eco
	Área 2		X		X					X	Eco
	Área 3				X		X				Eco
Payamino LF	1	X			X		X				Ind
Yuralpa A	1	X	Y	Y	X	X	X				Eco
	2										Ind
	3				X						Ind
Yuralpa E	1				X		X				Ind
Yuralpa G	1						X				Ind
	2	X		Y	X		X				Ind
	3				X						Ind
Yuralpa LF	1	X			X		X				Eco
	2	X		X			X		X		Eco
	3	X		Z	X		X				Eco
Subtotales de los parámetros de TCLP (exceso de un parámetro dentro de una piscina de lodo)											
% (de 39 piscinas de lodo)		18	5	13	23	3	19	1	4	1	
		46%	13%	33%	59%	8%	49%	3%	10%	3%	
% (de 12 sitios)		9	3	6	11	2	10	1	3	1	
		75%	25%	50%	92%	17%	83%	8%	25%	8%	
Subtotales de los sitios (exceso de al menos un parámetro de TCLP dentro de al menos una piscina de lodo)											
% (de 39 piscinas de lodo)		33					21				
		85%					54%				
% (de 12 sitios)		12					10				
		100%					83%				

Tabla 5.1: Síntesis de las conclusiones del estudio de las piscinas de lodo

Sitio	Piscina de lodo #	Superaciones de límites de los criterios de degradación en las piscinas revestidas					Superaciones de límites de los criterios de material de cobertura aplicables al suelo (Resultados del análisis)				
		Ba	TPH	HAP	pH	Cond	Ba	Cd	Ni	TPH	Criterio

Observaciones:

[1] X = superaciones de límites sobre la base de los análisis de extracción de TCLP exclusivamente; Y = superaciones de límites sobre la base de los análisis de TCLP y SPLP; Z = superaciones sobre la base del análisis de extracción de SPLP exclusivamente

[2] La totalidad de la información contenida *supra* se extrajo del ensayo realizado por Ramboll, con excepción de la información que se indica a continuación:

- En la piscina de lodo 1 de Lobo 3, GSI también realizó un ensayo. Los resultados de este último coincidieron con los de Ramboll.
- En las piscinas de lodo 1, 3 y 6 de Oso 9, solo GSI realizó ensayos.
- En la piscina de lodo 1 de Yuralpa Pad A, GSI también realizó ensayos. Solo identificaron pH y conductividad en exceso en el material de la piscina de lodo sobre la base del criterio de degradación, y bario en exceso sobre la base del criterio de remediación de los suelos, tal como se aplica al material de cobertura.

[3] La tabla expuesta *supra* solo contiene los resultados del análisis de TCLP. Los resultados del análisis de SPLP se exponen de manera separada en la Sección 6.

[4] Las piscinas de lodo 2, 3 y 4 de Chonta no se encuentran relacionadas con las operaciones de Perenco.

[5] La piscina de lodo 1 de Coca 18/19 no se encuentra relacionada con las operaciones de Perenco.

[6] En Lobo 3, se obtuvieron dos muestras adicionales (LOB03-MP04 y LOB03-MP05) en la línea de cercado sudeste debido a la existencia de registros contradictorios respecto de la alineación de las piscinas de lodo en el sitio. La observación de campo de Ramboll y los resultados de muestreo sugieren que estas muestras no fueron extraídas de las piscinas de lodo y confirman la alineación de las piscinas de lodo.

[7] Las piscinas de lodo 2 y 4 de Oso 9 se encuentran relacionadas con Perenco pero no fueron analizadas por Ramboll ni por las Partes. Estas dos piscinas de lodo probablemente se vean afectadas por una contaminación similar a aquella encontrada en la piscina de lodo 1 adyacente y en las piscinas de lodo 3 y 5, respectivamente.

[8] Se buscó cadmio, cromo y vanadio pero ninguno de estos elementos fue detectado mediante la aplicación del criterio de degradación más estricto en ninguna de las muestras del material de las piscinas de lodo.

[9] No se detectó cromo, plomo ni vanadio mediante la aplicación del criterio de remediación de los suelos más estricto en ninguna de las muestras de cobertura del suelo.

[Traducción del Tribunal]

567. A modo general, se puede concluir lo siguiente del estudio llevado a cabo en las piscinas de lodo:

(a) El Sr. MacDonald concluyó que no se había proporcionado información suficiente para confirmar la presencia de revestimientos sintéticos o de arcilla debajo de ninguna piscina de lodo determinada. Ramboll no perforó hasta el fondo de las piscinas de lodo para determinar la presencia o ausencia de material de revestimiento, puesto que ello habría comprometido las unidades si los revestimientos hubieran estado presentes. En algunos casos, Ramboll sí notó la

presencia de material de revestimiento rasgado dentro de los perímetros de algunas piscinas de lodo, pero no contaba con información relativa a su condición o a su extensión lateral en el resto de la piscina de lodo. Por consiguiente, el Sr. MacDonald decidió que, sin excepción, la información obtenida en los ensayos de degradación debería compararse con los estándares de las piscinas no revestidas presentes en la Tabla 7a del RAOHE conservadoramente.

(b) El uso actual del suelo del área de cada piscina de lodo se identificó como parte de las actividades de análisis de los sitios de Ramboll. La información analítica del material de cobertura se comparó con criterios industriales, agrícolas o de ecosistema sensible/residencial en la Tabla 3 del Anexo 2 del TULAS y en la Tabla 6 del RAOHE, según corresponda.

(c) Al menos una piscina de lodo no cumplió el estándar de rendimiento en los 12 sitios estudiados. Treinta y tres de las treinta y ocho piscinas de lodo estudiadas por el Perito no alcanzaron los estándares de rendimiento aplicables a las piscinas de lodo no revestidas especificados en el RAOHE (87%) y catorce de las treinta y ocho piscinas de lodo no alcanzaron los estándares de rendimiento aplicables a las piscinas revestidas especificados en el RAOHE (37%). Los contaminantes que no cumplieron con los criterios de rendimiento incluyen pH, bario, total de HAP, TPH y conductividad. Se considera que estas piscinas de lodo, al igual que dos piscinas de lodo adicionales ubicadas en Oso 9 que no fueron estudiadas pero que se infiere contienen una contaminación similar a aquella encontrada en las piscinas de lodo adyacentes que no cumplieron con uno o más criterios, requieren remediación.

(d) Los materiales que recubren veintiún de las treinta y ocho piscinas de lodo estudiadas no cumplen con el criterio de remediación aplicable a los suelos sobre la base de la determinación del uso del suelo aplicable en el área. Los contaminantes que superan los criterios aplicables incluyen bario, níquel, cadmio y TPH. En casi todos los casos (diecinueve de veintiún piscinas de lodo en total), el bario fue el contaminante de los que suscita preocupación que no cumplió los criterios. Ello, en opinión del Sr. MacDonald, sugiere una alta probabilidad de que el material de

cobertura de la piscina de lodo sea inadecuado o inexistente y que los materiales de las piscinas de lodo se encuentren sobre la superficie o cerca de ella.

(e) Al revisarlos en su totalidad, el 100% de los sitios que se estudiaron tenían al menos una piscina de lodo que no cumplía con los estándares de degradación publicados en el RAOHE (12/12 sitios). Además, el 83% de los sitios tenía al menos una piscina de lodo con material de cobertura inadecuado (10/12).

568. El Sr. MacDonald identificó las siguientes conclusiones específicas de los sitios como de especial interés:

(a) En Cóndor Norte, se observó una falla en la pendiente inmediatamente adyacente a los límites establecidos en los mapas para las piscinas de lodo. Según las observaciones de campo, parece que el envolvente de la falla de la pendiente podría extenderse a la piscina de lodo.

(b) En Coca 18/19, los datos sugieren que la extensión de la Piscina de Lodo 6 es mayor que el área establecida previamente en los mapas por las Partes.

(c) En Lobo 3, las ubicaciones de las piscinas de lodo no resultaban claras en un principio. Ramboll inspeccionó el área y recopiló muestras verticales compuestas en los bordes sudoeste y sudeste del pad para confirmar las ubicaciones de la piscina de lodo. Se determinó que las piscinas de lodo se hallan ubicadas en el borde sudoeste del pad.

(d) Oso 9A tiene una pendiente que corre del noreste al sudoeste y tiene pendientes profundas hacia el norte y hacia el este. En la región noreste del sitio, se evidencian fallas en la pendiente. Se observó plástico negro rasgado, posiblemente relacionado con un sistema de revestimiento, en la región sudoeste del sitio.

(b) Aguas subterráneas

569. Entre el 13 de noviembre y el 14 de diciembre de 2017, Ramboll recopiló muestras de 34 pozos de monitoreo permanente instalados en 12 sitios. Las muestras fueron analizadas por TPH y metales tal como se indica *supra*. Las conclusiones se exponen en la Tabla 5.2 del Informe del Sr. MacDonald.

Tabla 5.2: Síntesis de las conclusiones del estudio de aguas subterráneas

Sitio	Ubicación del pozo (próximo a una CAR#)	Identificación del pozo	Litología	Turbidez	Exceso de criterios aplicables a las AS	
			% de arcilla	NTU	Ba	TPH
Coca 2 y CPF	Adyacente a la piscina de lodo (02-335)	COC02-MW01	15,1	2,7	X	X
	Adyacente a la formación de pozos de agua (CPF-352)	COC02-MW02	14,3	0,0		X
	Separador de vertidos de agua y petróleo API; pantano (CPF-354/357)	COC02-MW03	18,9	0,0		X
		COC02-MW04	3,2	0,0		X
		COC02-MW05	7,8	0,0		X
Gacela 1 y CPF	Oeste de la plataforma (no CAR)	GAC01-MW01	26,2	1,5	X	X
	Derrame en el pequeño arroyo ubicado al sudoeste de la plataforma (02-371/1Y8-195/201)	GAC01-MW02	18,2	3,6	X	X
Gacela 2	Oeste de la plataforma y de la piscina de lodo (no CAR)	GAC02-MW01	32,6	13,5		X
	Sudoeste de la plataforma y de la piscina de lodo (02-369/02-422)	GAC02-MW02	65,8	13,3		X
Jaguar 1	Noroeste de la plataforma (no CAR)	JAG01-MW01 [3]	8,9	1,2		
	Oeste de la plataforma (1-311)	JAG01-MW02	13,9	0,3		X
Jaguar 2	Adyacente a la piscina de lodo (2-314/315)	JAG02-MW01	-	13,8		X
	Oeste de la piscina de lodo (2-314/315)	JAG02-MW02 [4]	57,3	1,2		
	Noroeste de la plataforma (2-298)	JAG02-MW03	30,8	7,8		X
Mono 1 y CPF	Norte de la plataforma (112)	MON01-MW01	34,1	0,0	X	X
	Noreste de la plataforma (111)	MON01-MW02	14,9	0,0		
	Este de la plataforma en el área de derrame de lodos (105/CPF-400)	MON01-MW03	38,8	0,0	X	X
	Sur de la plataforma (CPF-486)	MON01-MW04	18,2	4,2	X	X
Oso 9	Oeste de las piscinas de lodo (9-331/340)	OSO09-MW01	4,9	7,6		
	Adyacente a las piscinas de lodo 1-9 (9-331/340)	OSO09-MW02	13,9	0,9		X
Payamino 1 y CPF	Oeste de la reserva de agua para caso de incendio	PAY01-MW01	13,0	12,6		X
	Zona de captación	PAY01-MW02	28,0	7,1		X
	Noroeste de CPF (CPF-166)	PAY01-MW03	16,4	5,4		
Payamino 2/8	Pantano al noreste de la piscina de lodo (143/2Y8-351/435)	PAY02-MW01	22,7	13,2	X	X
	Pantano al noreste de la piscina de lodo (143/2Y8-351/435)	PAY02-MW02	49,3	0,0	X	
	Pantano al este de la plataforma (143/2Y8-351/435)	PAY02-MW04	50,3	0,0		X
Payamino 4/Payamino 14/20/24	Ruta de acceso al río, noreste (04-114)	PAY04-MW01	-	3,1	X	X
	Ruta de acceso al río en la esquina del sitio (04-114)	PAY04-MW02	6,6	0,0	X	X

Tabla 5.2: Síntesis de las conclusiones del estudio de aguas subterráneas

Sitio	Ubicación del pozo (próximo a una CAR#)	Identificación del pozo	Litología	Turbidez	Exceso de criterios aplicables a las AS	
			% de arcilla	NTU	Ba	TPH
	Área contaminada con petróleo al noroeste de Pay-14/20/24 y al sudoeste de la piscina de lodo	PAY04-MW03	16,5	0,0	X	X
	Adyacente a la piscina de lodo (no CAR)	PAY14-MW01	7,6	13,7		
Payamino 13	Sudoeste de la plataforma (no CAR)	PAY13-MW01	15,5	0,0		X
	Sur de la plataforma (no CAR)	PAY13-MW02	23,0	12,1	X	X
Payamino 15	Este de la plataforma (no CAR)	PAY15-MW01	30,4	9,8	X	X
	Adyacente a la piscina de lodo (111)	PAY15-MW02	32,8	0,0		
Total de pozos con exceso de TPH y/o bario						
% (de 34 pozos - incluye todos)					13	25
					38%	74%
Total de sitios con al menos un pozo con exceso de TPH y/o bario						
% (de 12 sitios – incluye todos)					7	12
					58%	100%

Observaciones:
[1] A fin de asistir en la orientación respecto de la ubicación de los pozos, Ramboll ha proporcionado una #CAR, tal como ha sido identificado por una o ambas Partes.
[2] Al recolectar las muestras, se observaron el brillo y olor característicos del petróleo en las muestras extraídas de los pozos de monitoreo que se mencionan a continuación: COC02-MW01, COC02-MW02, COC02-MW03, y COC02-MW04, GAC01-MW02, JAG02-MW01, MON01-MW01, MW02, MW03, MW04, OSO09-MW02, PAY01-MW01, PAY02-MW01, PAY02-MW02, PAY02-MW04, PAY04-MW03, PAY13-MW01, PAY13-MW02 y PAY15-MW02.
[3] La concentración de TPH en la muestra JAG01-MW01 coincidía con el criterio aplicable (325 ug/L).
[4] La muestra JAG02-MW02 fue analizada en busca de TPH utilizando el método TX1005 en lugar del método USEPA 8015. El método de detección para esta muestra (450 ug/L) superaba el criterio aplicable de 325 ug/L.

[Traducción del Tribunal]

570. En términos generales, se puede concluir lo siguiente:

(a) El Sr. MacDonald consideró que las técnicas de construcción y muestreo de pozos de Ramboll facilitaban la producción de muestras de aguas subterráneas sin filtrar límpidas, representan adecuadamente la calidad química del agua subterránea en los sitios. En todos los casos, se observó que el agua subterránea de muestra estaba limpia, no contenía sedimentos ni nubosidad y tenía una turbidez baja (a saber, menos de 14 NTU, y, en la mayoría de los casos, menos de 10 NTU).

(b) Ramboll recogió muestras del suelo en las zonas acuíferas de cada pozo para evaluar el contenido de arcilla en el intervalo analizado. Dicho muestreo se realizó, en parte, para determinar si había alguna relación entre el contenido de arcilla y los niveles de turbidez, y para abordar la referencia contenida en el TULAS con

respecto a los criterios aplicables a las aguas subterráneas. Mientras que el contenido de arcilla variaba en las distintas ubicaciones y dentro de los sitios, se encontró agua subterránea en todos los pozos y parece haber poca correlación entre el contenido de arcilla y los niveles de turbidez, tal como se determinara mediante las actividades de muestreo. La relevancia de estas conclusiones se aborda en más detalle en la Sección 6.1. del Informe del Sr. MacDonald.

(c) Según los resultados de muestreo de Ramboll, la contaminación por TPH en el agua subterránea por encima del estándar establecido en el TULAS está presente en los 12 sitios que se estudiaron, y en un 74% de los pozos de monitoreo muestreados. La máxima concentración de TPH que se observó fue de 1915 µg/L en Payamino 2/8, en contraste con el estándar del TULAS de 325 µg/L. Se encontró bario en un 58% de los sitios y en un 38% de los pozos muestreados. La máxima concentración que se observó de bario fue de 4700 µg/L en Gacela 1, en contraste con el estándar de 338 µg/L. No se identificó ningún otro contaminante que suscite preocupación en los pozos de monitoreo.

(c) Suelos

571. Entre el 19 de septiembre y el 15 de diciembre de 2017, Ramboll obtuvo y analizó 801 muestras de suelo de 40 sitios. Dichas muestras se obtuvieron en ubicaciones diseñadas para delinear áreas de suelo cuya contaminación excediere los criterios numéricos de Ecuador establecidos en el TULAS (Tabla 3 del Anexo 2) o en el RAOHE (Tabla 6) y para llenar lagunas de información significativas. En general, el Sr. MacDonald descubrió que el total de los excesos de concentración de los criterios de los suelos no se relacionan directamente con la gravedad de la contaminación en el sitio ni con la necesidad de remediación del sitio. No obstante, el Sr. MacDonald efectuó dos observaciones clave que resultan de aplicación a la totalidad de la información de los suelos:

(a) La información recopilada por Ramboll llena lagunas de información y complementa la información previamente recopilada por las Partes que reveló contaminación proveniente de los yacimientos petrolíferos, principalmente por

bario y TPH. Puede, en su opinión, utilizarse para estimar la huella de remediación[655].

(b) Se encontraron concentraciones elevadas de cadmio y vanadio en los Bloques. Tal como se determinara mediante las evaluaciones de fondo realizadas tanto por las Partes como por Ramboll, según el Sr. MacDonald, estas concentraciones parecen derivar en gran parte de condiciones naturales de fondo[656]. Especialmente en el caso del vanadio, la distribución de este metal parece ser extendida y al azar, con una gran parte de concentraciones naturales. Hay unos pocos casos en los que se encontraron concentraciones de cadmio y vanadio superiores a las concentraciones de fondo calculadas. En dichos casos, se realizó un muestreo de delineación de estos compuestos químicos.

(i) Bloque 7

572. Respecto del Bloque 7, las conclusiones de Ramboll fueron las siguientes[657]:

573. **Coca 1**: se delinearon excesos en el suelo de la zona pantanosa baja al sudoeste de la plataforma (CAR 330; vertido histórico) mediante la obtención de muestras en las excavaciones COC01-01 a COC01-06. El olor del petróleo se percibió en los suelos subsuperficiales en COC01-02 y COC01-05. No se detectó TPH ni bario por encima de los criterios agrícolas en ninguna de las muestras. No obstante, el vanadio (hasta 180 mg/kg) excedió el criterio regulatorio en la región sudoeste de dicha área. Combinada con las características topográficas, esta información proporciona un marco adecuado para el establecimiento de la huella de remediación[658].

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655 *Ibid*., pág. 78.

656 *Id.*

657 *Ibid*., Sección 5.3.3.1.

658 *Ibid*., págs. 78-79.

574. **Coca 2/CPF**: dentro de las áreas estudiadas por Ramboll, los excesos de TPH que anteceden no fueron delineados por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de cuatro áreas principales[659]:

(a) Se delineó el TPH en el área sudoeste de la plataforma/CPF (CAR 40; separador de vertidos de petróleo y agua) mediante la obtención de muestras en las excavaciones COC02-01 a COC02-03 puesto que el TPH no excedió el criterio aplicable en ninguna de las muestras.

(b) Se delineó el TPH en el área norte de la ex formación del pozo de agua (CAR 352) mediante la obtención de muestras en las excavaciones COC02-04 y COC02-05 puesto que el TPH no excedió el criterio aplicable en ninguna de las muestras.

(c) Se delineó el TPH en la zona pantanosa al sudeste de la plataforma/CPF (CAR 354; vertido histórico en el pantano) mediante la obtención de muestras en las excavaciones COC02-06 a COC02-15 y COC02-18159 puesto que el TPH no excedió el criterio aplicable en ninguna de las muestras. Debería observarse, no obstante, que se percibieron manchas y olor característicos del petróleo en los suelos subsuperficiales en COC02-11 y COC02-14.

(d) Se estudió el TPH en el área oeste de la piscina de lodo de Coca 2 (CAR 335), en donde se percibió un leve olor a petróleo durante la instalación del pozo adyacente a la piscina de lodo, mediante la obtención de muestras en las excavaciones COC02-16 y COC02-17. El TPH no excedió el criterio aplicable en ninguna de las muestras.

575. **Coca 4**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: se delineó el bario en los suelos de la zona pantanosa al este de la plataforma (CAR 244; separador de vertidos de petróleo y agua) mediante la

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659 *Ibid*., pág. 79.

obtención de muestras en las excavaciones COC04-01 a COC04-04 puesto que el bario no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras[660].

576. **Coca 6**: dentro de las áreas estudiadas por Ramboll, los excesos de bario y TPH que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de dos áreas principales[661]:

(a) También se estudió el área sudeste de la plataforma (que no se encuentra asociada con una CAR específica), que es un área relativamente plana y que topográficamente se encuentra más elevada que la zona de pantano, mediante la obtención de muestras en las excavaciones COC06-01 a COC06-04, fundamentalmente en búsqueda de bario. Salvo en la muestra de delineación vertical, el bario (hasta 1.070 mg/kg) excedió el criterio de ecosistema sensible/residencial en todas las ubicaciones de muestra del área de estudio. El vanadio (hasta 153 mg/kg) también excedió el criterio regulatorio en la misma área.

(b) Se estudió una zona pantanosa baja (que fuera previamente descripta por GSI como un alcantarillado) también ubicada al sudeste de la plataforma (CAR 257; vertido histórico de actividades de *workover*) mediante la obtención de muestras en las excavaciones COC06-05 a COC06-13. El olor y la mancha de petróleo se percibieron en los suelos subsuperficiales en COC06-06 y COC06-10. No obstante, el TPH no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras. El bario (hasta 951 mg/kg) excedió el criterio aplicable en la región oeste del pantano y en ciertos puntos a lo largo del cerro que limita con el pantano al este. El vanadio (hasta 216 mg/kg) también excedió el criterio aplicable en las mismas áreas.

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660 *Ibid*., págs. 79-80.

661 *Ibid*., pág. 80.

577. **Coca 8**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de dos áreas principales[662]:

(a) Se estudió un área al noroeste de la plataforma (CAR 19; separador de vertidos de petróleo y agua) mediante la obtención de muestras en las excavaciones COC08-01 a COC08-04. El bario (1.190 mg/kg) excedió el criterio agrícola solo al sur del área estudiada. El vanadio (hasta 208 mg/kg) también excedió el criterio agrícola en la misma área.

(b) Se estudió un área al sudoeste de la plataforma (CAR 20; separador de vertidos de petróleo y agua) mediante la obtención de muestras en las excavaciones COC08-05 a COC08-08. El bario (1.480 mg/kg) excedió el criterio agrícola solo al norte del área estudiada. El níquel (hasta 60,4 mg/kg) y el vanadio (hasta 207 mg/kg) también excedieron el criterio agrícola en el área de estudio.

(c) También se estudió la zona pantanosa al sur de las piscinas de lodo 2 a 4 (CAR 251 mediante la obtención de muestras en las excavaciones COC08-09 a COC08-21. El olor y la mancha de petróleo se percibieron en los suelos subsuperficiales de la excavación COC08-09. El bario (hasta 11.000 mg/kg) excedió el criterio de ecosistema sensible/residencial en el intervalo de muestra más profundo y al este, sur y oeste del área de estudio. El cadmio (hasta 1,12 mg/kg), el plomo (hasta 89,1 mg/kg), el níquel (hasta 64,9 mg/kg) y el vanadio (hasta 184 mg/kg) excedieron los criterios aplicables en todas las direcciones alrededor del pantano.

578. **Coca 9**: dentro de las áreas estudiadas por Ramboll, los excesos de vanadio y níquel que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de dos áreas principales[663]:

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662 *Ibid*., págs. 80-81.

663 *Ibid*., pág. 81.

(a) Se estudió el área al noreste de la plataforma (CAR 61; posible vertido del pozo de inyección) mediante la obtención de muestras en las excavaciones COC09-01 a COC09-05. El vanadio y el níquel no excedieron el criterio de ecosistema sensible/residencial en ninguna de las muestras. El bario (hasta 1.880 mg/kg) excedió el criterio aplicable en las áreas norte y noroeste.

(b) Se estudió el área al sudeste de la plataforma (CAR 60; separador de vertidos de petróleo y agua) mediante la obtención de muestras en las excavaciones COC09-06 a COC09-08. El níquel no excedió el criterio agrícola en ninguna de las muestras. El vanadio (hasta 172 mg/kg) excedió el criterio aplicable en las áreas este y sudeste.

579. **Coca 10/16**: dentro de las áreas estudiadas por Ramboll, los excesos de bario y TPH que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: se estudió una zona pantanosa al norte de la plataforma (CAR 175; separador de vertidos de petróleo y agua) mediante la obtención de muestras en COC10-01 a COC10-03. El TPH no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras. El bario (hasta 993 mg/kg) excedió el criterio aplicable en el borde empinado al norte de dicha zona pantanosa. El vanadio (hasta 154 mg/kg) y el níquel (hasta 50,1 mg/kg) también excedieron el criterio aplicable en la misma área[664].

580. **Coca 18/19**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de tres áreas principales: [665]

(a) Se delinearon impactos anteriores en los suelos adyacentes al pozo Coca 18 (CAR 273) mediante la obtención de muestras en COC18-01 a COC18-03. El bario no excedió el criterio aplicable en ninguna de las muestras. No obstante, se

664 *Ibid*., págs. 81-82.

665 *Ibid*., pág. 82.

detectaron excesos de vanadio respecto del criterio industrial aplicable a este último (143 a 175 mg/kg) al este, sur y oeste del pozo Coca 18.

(b) Se estudió el área al sudoeste de la piscina de lodo 6 (CAR 274) mediante la obtención de muestras en las excavaciones COC18-04 a COC18-11. Se percibió olor a petróleo en las excavaciones COC18-04 y COC18-06. El bario (hasta 1580 mg/kg) excedió el criterio de ecosistema sensible/residencial en las áreas este, sur y oeste de la piscina de lodo 6. El vanadio (hasta 224 mg/kg) también excedió el criterio aplicable en las mismas áreas. Además, en ciertas ubicaciones aisladas, se detectaron niveles de cromo (hasta 88,1 mg/kg) y níquel (hasta 52,4 mg/kg) por encima del criterio aplicable.

(c) El acopio 1 (que no es una CAR identificada pero los registros del proyecto sugieren un área de posibles desechos históricos de materiales provenientes de yacimientos petrolíferos) también se estudió mediante la obtención de muestras en las excavaciones en COC18-12 a COC18-14. Se detectaron concentraciones de bario (hasta 6220 mg/kg) superiores al criterio de ecosistema sensible/residencial aplicable. También se detectaron valores de vanadio (hasta 180 mg/kg) y cadmio (hasta 1,35 mg/kg) superiores al criterio aplicable.

581. **Cóndor Norte**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: se estudió el desprendimiento de tierras al sur de la plataforma (no asociada con una CAR específica) mediante la obtención de muestras en CON01-01 a CON01-05. El bario (hasta 2.140 mg/kg) excedió el criterio de ecosistema sensible/residencial en el intervalo de muestra más profundo (excavaciones CON01-01 y CON01-05) y en la excavación CON01-02. El cadmio (hasta 4,97 mg/kg) también excedió el criterio aplicable en todos los puntos de muestra. Los límites de los materiales

desprendidos se definieron mediante el uso de GPS y sirvieron para establecer la huella de remediación[666].

582. **Gacela 1/8/CPF**: dentro de las áreas estudiadas por Ramboll, los excesos de bario y TPH que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de dos áreas principales[667]:

(a) Se estudió la zona pantanosa al sur de la plataforma (CAR 371; vertido histórico) mediante la obtención de muestras en las excavaciones GAC01-01 a GAC01-11. El olor y la mancha de petróleo se percibieron en los suelos subsuperficiales en GAC01-01, GAC01-02, GAC01-04, GAC01-10 y GAC01-11. No obstante, el TPH no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras. El bario no excedió el criterio aplicable en ninguna de las muestras.

(b) Se estudió el área al sudoeste de la plataforma (CAR 63; vertido histórico) mediante la obtención de muestras en las excavaciones GAC01-12 a GAC01-17. El olor del petróleo se percibió en los suelos subsuperficiales en la excavación GAC01-16. No obstante, no se detectó TPH ni bario por encima de los criterios agrícolas en ninguna de las muestras.

583. **Gacela 2**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de dos áreas principales[668]:

(a) Se estudió el área oeste y la pendiente hacia abajo de la plataforma (no asociadas con una CAR específica) mediante la obtención de muestras en las excavaciones GAC02-01 a GAC02-04. El bario (hasta 1.610 mg/kg) excedió el criterio de ecosistema sensible/residencial en la región noreste de esta área.

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666 *Ibid*., pág. 83.

667 *Id.*

668 *Ibid*., pág. 84.

(b) Se estudió el área comprendida entre las dos piscinas de lodo de la plataforma (no asociada con una CAR específica) mediante la obtención de muestras en las excavaciones GAC02-05 a GAC02-08. El olor y la mancha de petróleo se percibieron en los suelos subsuperficiales en GAC02-06 y GAC02-07. No obstante, el TPH no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras. El bario (hasta 4.790 mg/kg) excedió el criterio de ecosistema sensible/residencial en esta área. La información indica que resulta posible que las dos piscinas de lodo sean contiguas.

584. **Gacela 4**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: el bario presente en los suelos adyacentes al pozo Gacela 4 (CAR 304; posible vertido del brocal) se delineó mediante la obtención de muestras en las excavaciones GAC04-01 a GAC04-04 puesto que el bario no excedió el criterio industrial en ninguna de las muestras. El vanadio (hasta 135 mg/kg) excedió el criterio aplicable al noreste y sur de dicha área[669].

585. **Gacela 5**: dentro de las áreas estudiadas por Ramboll, los excesos de plomo que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: el plomo presente en los suelos adyacentes al pozo Gacela 5 (CAR 307; posible vertido del brocal) se delineó mediante la obtención de muestras en las excavaciones GAC05-01 a GAC05-03 puesto que el plomo no excedió el criterio industrial en ninguna de las muestras. El vanadio (hasta 138 mg/kg) y el cromo (hasta 106 mg/kg) también excedieron el criterio regulatorio al este de la misma área[670].

586. **Jaguar 1**: dentro de las áreas estudiadas por Ramboll, los excesos de bario, níquel y TPH que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de tres áreas principales[671]:

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669 *Ibid*., pág. 84.

670 *Ibid*., págs. 84-85.

671 *Ibid*., pág. 85.

(a) Se estudió el área noroeste de la piscina de lodo y alrededor de las dos piscinas abiertas (CAR 312) mediante la obtención de muestras en las excavaciones JAG01-01 a JAG01-03, JAG01-15 y JAG01-17. El níquel (hasta 81,9 mg/kg) excedió el criterio de ecosistema sensible/residencial en todas las áreas de muestra. El bario (722 mg/kg en JAG01-03), el cromo (hasta 127 mg/kg en JAG01-01 a JAG01-03 y JAG01-17) y el vanadio (hasta 193 mg/kg en todos los puntos de las excavaciones) también excedieron el criterio regulatorio aplicable.

(b) Se estudió el área que rodea la estación de válvula (no asociada con una CAR específica), en donde ya había se había detectado un exceso de vanadio (muestra de GSI JA01-3T-01) y los impactos históricos del petróleo fueron informados por GSI, mediante la obtención de muestras en las excavaciones JAG01-08 a JAG01-11. Si bien no se buscó TPH en las muestras obtenidas, no se identificó evidencia alguna de crudo en ninguna de estas excavaciones. Las muestras obtenidas en esta área indican la presencia de níquel (hasta 40,8 mg/kg) y vanadio (hasta 165 mg/kg) por encima del criterio regulatorio.

(c) El área de cauce y su pantano (CAR 311) se delinearon mediante la obtención de muestras en las excavaciones JAG01-04 a JAG01-07, JAG01-12 a JAG01-14 y JAG01-16. El olor del petróleo se percibió en los suelos subsuperficiales de JAG01-06. No obstante, no se detectó TPH ni bario por encima de los criterios de ecosistema sensible/residencial en ninguna de las muestras. En ciertas ubicaciones aisladas, el cromo (hasta 88,5 mg/kg), el níquel (hasta 81,7 mg/kg) y el vanadio (hasta 183 mg/kg) excedieron el criterio regulatorio.

587. **Jaguar 2**: dentro de las áreas estudiadas por Ramboll, los excesos de bario, níquel y TPH que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de dos áreas principales[672]:

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672 *Ibid*., págs. 85-86.

(a) El área oeste de la piscina de lodo (CAR 314) se estudió mediante la obtención de muestras en las excavaciones JAG02-01 a JAG02-05 y JAG02-15 a JAG02-17. Las excavaciones JAG02-02 y JAG02-15 a JAG02-17 se realizaron en el área de la falla de la pendiente al noroeste de las piscinas de lodo. El olor y/o la mancha de petróleo se percibieron en los suelos subsuperficiales en JAG02-02, JAG02-04, JAG02-15 y JAG02-17. Por consiguiente, se añadió el análisis de TPH para las muestras de este sitio. El TPH (hasta 1.190 mg/kg) presente en JAG02-15 y el bario (hasta 1.100 mg/kg) presente en JAG02-01, JAG02-15 y JAG02-16 excedieron los criterios de ecosistema sensible/residencial en la región norte de esta área. El cromo (hasta 114 mg/kg), el níquel (hasta 220 mg/kg) y el vanadio (hasta 247 mg/kg) también excedieron los criterios regulatorios en todos los puntos de excavación, mientras que el plomo no excedió el criterio aplicable en ninguna de las muestras.

(b) Se estudió el área noroeste de la plataforma (CAR 298; posible vertido histórico) mediante la obtención de muestras en las excavaciones JAG02-06 a JAG02-14. En la superficie de varios puntos ubicados dentro del área de estudio se observó la presencia de lo que aparenta ser crudo intemperizado. No obstante, el TPH no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras. El bario (hasta 7.920 mg/kg) y el níquel (hasta 88,8 mg/kg) excedieron el criterio aplicable en varios puntos al oeste, norte y noreste. El plomo (279 mg/kg) y el cadmio (1,76 mg/kg) excedieron el criterio aplicable en JAG02-07. El vanadio (hasta 204 mg/kg) y el cromo (hasta 121 mg/kg) también excedieron el criterio aplicable en todos los puntos de excavación.

588. **Jaguar 3**: dentro de las áreas estudiadas por Ramboll, los excesos de bario y vanadio que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de dos áreas principales[673]:

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673 *Ibid*., págs. 86-87.

(a) Se estudiaron impactos anteriores en los suelos adyacentes al pozo Jaguar 3 (CAR 237, posibles vertidos del brocal) mediante la obtención de muestras en JAG03-01 a JAG03-03. El bario excedió los criterios de ecosistema sensible/residencial al sur y al oeste del pozo Jaguar 3. El cadmio (hasta 1,54 mg/kg), el cromo (hasta 168 mg/kg), el plomo (hasta 139 mg/kg), el níquel (hasta 80,1 mg/kg) y el vanadio (hasta 213 mg/kg) también excedieron los criterios regulatorios en uno o más puntos al sur y al oeste del pozo Jaguar 3.

(b) Se estudió el área de la plataforma este (no asociada con una CAR específica) mediante la obtención de muestras en las excavaciones JAG03-04 a JAG03-08 para estudiar los valores elevados de vanadio en el lado este de la plataforma. El vanadio (hasta 196 mg/kg) excedió el criterio de ecosistema sensible/residencial en todas las excavaciones. El bario (hasta 936 mg/kg) excedió el criterio regulatorio en sitios al este y sur de esta área. El cromo (hasta 118 mg/kg) excedió el criterio aplicable en todas las ubicaciones de muestra, mientras que el níquel (45,8 mg/kg) excedió los criterios regulatorios solo en JAG03-04, JAG03-06 y JAG03-07.

589. **Jaguar 5/CPF**: dentro de las áreas estudiadas por Ramboll, los excesos de plomo y vanadio que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de tres áreas principales[674]:

(a) Se delineó el área sudeste de la plataforma (no asociada con una CAR específica) mediante la obtención de muestras en las excavaciones JAG05-01 a JAG05-03. El plomo no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras, con relación al objetivo inicial de estudiar esta área por su proximidad respecto de zonas residenciales. El vanadio (hasta 182 mg/kg) y el cromo (hasta 78,2 mg/kg) también excedieron el criterio regulatorio en todos los puntos de excavación.

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674 *Ibid*., pág. 87.

(b) Se estudiaron los suelos adyacentes al depósito de combustible (no asociado con una CAR específica) mediante la obtención de muestras en la excavación JAG05-04. El vanadio (hasta 175 mg/kg) también excedió el criterio industrial en este punto. El cromo (hasta 67,3 mg/kg) también excedió el criterio regulatorio en este punto.

590. **Jaguar 7/8**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: el bario en el área de cauce al este de la plataforma (no asociada con una CAR específica, pero posiblemente relacionada con un separador de vertidos de petróleo y agua) se delineó mediante la obtención de muestras en JAG07-01 a JAG07-03 puesto que no se detectaron niveles de dicho elemento por encima del criterio agrícola en ninguna de las muestras. El cadmio (hasta 1,39 mg/kg) y el cromo (hasta 65,8 mg/kg) excedieron el criterio regulatorio en dos puntos diferentes de esta área y lo mismo sucedió con el níquel (hasta 63,7 mg/kg) en dos puntos de dicha área[675].

591. **Lobo 1**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: se estudió el área que rodea a la piscina de lodo (CAR 211) mediante la obtención de muestras en las excavaciones LOB01-03, LOB01-04 y LOB01-04A. El olor del petróleo se percibió en los suelos subsuperficiales en LOB01-04, y, por consiguiente, se realizó un análisis de TPH en LOB01-04 y LOB01-04A. No obstante, el TPH no excedió el criterio agrícola en ninguna de las muestras. El bario (hasta 10.600 mg/kg) excedió el criterio aplicable en las regiones sur y oeste de esta área. El cadmio (hasta 2,62 mg/kg), el cromo (hasta 88,3 mg/kg), el plomo (hasta 212 mg/kg) y el níquel (hasta 60 mg/kg) también excedieron el criterio regulatorio en estos mismos puntos[676].

592. **Lobo 4**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional

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675 *Ibid*., págs. 87-88.

676 *Ibid*., pág. 88.

alrededor de un área principal: el área noreste de la plataforma (no asociada con una CAR específica) se estudió mediante la obtención de muestras en las excavaciones LOB04-01 a LOB04-05. El olor y la mancha de petróleo se percibieron en los suelos subsuperficiales en LOB04-02, LOB04-03, LOB04-04 y LOB04-05. El bario (hasta 3.180 mg/kg) excedió el criterio de ecosistema sensible/residencial en el intervalo más superficial en LOB04-02, y en los intervalos más profundos que fueron muestreados en LOB04-01, LOB04-03 y LOB04-05[677].

593. **Mono 1-5/CPF**: dentro de las áreas estudiadas por Ramboll, los excesos de bario y/o plomo que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de tres áreas principales[678]:

(a) Se estudió el área norte de la plataforma (no asociada con una CAR específica; ubicada al sudoeste del separador de vertidos de petróleo/agua API, en el que se observó un desborde en ocasión de lluvias fuertes) mediante la obtención de muestras en las excavaciones MON01-01 a MON01-04. El olor del petróleo se percibió en los suelos subsuperficiales en MON01-02. El bario (hasta 1.400 mg/kg) excedió el criterio de ecosistema sensible/residencial en MON01-03.

(b) Se estudió el área al este de la plataforma (CAR 105; pozos/piscinas anteriores) mediante la obtención de muestras en las excavaciones MON01-05 a MON01-10. El bario (hasta 1.840 mg/kg) excedió los criterios de ecosistema sensible/residencial al sur y el plomo (hasta 161 mg/kg) excedió el criterio aplicable al norte y al sur. Además, en ciertos puntos aislados, se detectaron niveles de cromo (hasta 78,8 mg/kg), níquel (hasta 57,9 mg/kg) y vanadio (hasta 153 mg/kg) por encima del criterio aplicable en MONO01-08.

(c) Se estudió el área sur de la plataforma (no asociada con una CAR específica; relevó derrames históricos en la trampa petrolífera sudeste) mediante la obtención de muestras en las excavaciones MON01-11 a MON01-23. Se

677 *Ibid*., págs. 88-89.

678 *Ibid*., pág. 89.

percibió olor a petróleo en la superficie del suelo de MON01-11, por lo que se añadió el análisis de TPH en este punto. El TPH no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras. El bario (hasta 1.280 mg/kg) y el plomo (hasta 88,7 mg/kg) excedieron el criterio aplicable en la región norte de esta área de muestreo. En ciertos puntos aislados, el cromo (hasta 138 mg/kg), el níquel (hasta 56,2 mg/kg) y el vanadio (hasta 183 mg/kg) excedieron el criterio aplicable.

594. **Mono Sur**: dentro de las áreas estudiadas por Ramboll, los excesos de bario y/o plomo que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: se estudió el área al noreste de la piscina de lodo ubicada en el mapa y en el vertedero de un separador de petróleo/agua (no asociado con una CAR específica) mediante la obtención de muestras en las excavaciones MON06-01 a MON01-06. El bario (hasta 595 mg/kg) excedió el criterio de ecosistema sensible/residencial al este, pero el plomo no excedió el criterio aplicable en ninguna de las muestras. El cromo (hasta 83,1 mg/kg), el níquel (hasta 46,7 mg/kg) y el vanadio (hasta 148 mg/kg) también se detectaron por encima del criterio aplicable en la mayoría de los puntos de excavación[679].

595. **Oso 1/CPF**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: se delineó el tratamiento de agua de tormentas al sur de la plataforma (no asociada con una CAR específica) mediante la obtención de muestras en las excavaciones OSO01-01 a OSO01-06. El bario (hasta 3.870 mg/kg) excedió el criterio industrial en dos excavaciones dentro de dicha característica[680].

596. **Oso A**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: el área al oeste de la plataforma (CAR 250; separador de

679 *Ibid*., págs. 89-90.

680 *Ibid*., pág. 90.

vertidos de petróleo y agua) se delineó mediante la obtención de muestras en las excavaciones OSOA-01 a OSOA-05. El olor y/o la mancha de petróleo se percibieron en los suelos subsuperficiales en OSOA-01 y OSOA-02. Por consiguiente, se añadió el análisis de TPH para las muestras de este sitio. Sin embargo, el TPH y el bario no excedieron los criterios industriales aplicables en ninguna de las muestras[681].

597. **Payamino 1/CPF**: dentro de las áreas estudiadas por Ramboll, los excesos de bario y TPH que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de cuatro áreas principales[682]:

(a) Se delineó el suelo adyacente al edificio de bombeo de combustible de CPF (área no asociada con una CAR específica) fue delineado mediante la obtención de muestras en las excavaciones PAYCPF-01 a PAYCPF-03. El olor y la mancha de petróleo se percibieron en los suelos subsuperficiales en PAYCPF-01 y PAYCPF-02. No obstante, el TPH no excedió el criterio industrial en ninguna de las muestras.

(b) Se estudió la zona pantanosa más al noroeste de CPF (área no asociada con una CAR específica) mediante la obtención de muestras en las excavaciones PAY01-01 a PAY01-05, PAY01-16 y PAY01-17. El TPH no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras. Sin embargo, el bario (hasta 812 mg/kg) excedió el criterio aplicable al oeste y al noroeste. En uno de los puntos, el cromo (hasta 69 mg/kg) también se detectó por encima del criterio aplicable.

(c) Se delineó el TPH y el bario presentes en la cuenca hidrográfica (no asociada con una CAR específica) mediante la obtención de muestras en las excavaciones PAY01-06 a PAY01-8, PAY01-10 y PAY01-18, generalmente ubicados fuera de la parte superior de la cuenca hidrográfica. El olor, las manchas de petróleo y "cuentas" de hidrocarburos líquidos en fase no acuosa se observaron en los

681 *Ibid*., págs. 90-91.

682 *Ibid*., págs. 91-92.

suelos subsuperficiales poco profundos durante la perforación del pozo de monitoreo PAY01-MW02 dentro de esta área de cuenca. No obstante, no se detectó TPH ni bario por encima de los criterios de ecosistema sensible/residencial en ninguna de las muestras. El vanadio (hasta 145 mg/kg) excedió el criterio aplicable en uno de los puntos. Se delineó el área adyacente a la piscina de cemento (CAR 135) mediante la obtención de muestras en las excavaciones de PAY01-11 a PAY01-15. El olor y/o las manchas característicos del petróleo se percibieron en los suelos subsuperficiales de PAY01-12, PAY01-14 y PAY01-21. No obstante, el TPH no excedió el criterio aplicable en ninguna de las muestras.

598. **Payamino 2/8**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: se estudió la zona pantanosa (CAR 351) mediante la obtención de muestras en las excavaciones PAY02-01 a PAY02-16. En la superficie al noreste de la plataforma, entre la plataforma y la zona pantanosa, se observó la presencia de lo que aparenta ser crudo intemperizado. En PAY02-01 y PAY02-02, se observaron manchas de petróleo en la superficie, y, en los suelos subsuperficiales y en el agua de esos mismos puntos, se percibieron olor y manchas de petróleo y cuentas de hidrocarburos líquidos en fase no acuosa. También se detectaron olor y manchas de petróleo en los suelos subsuperficiales de PAY02-04. No obstante, el TPH no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras. El bario (hasta 5.810 mg/kg) excedió el criterio de ecosistema sensible/residencial en el intervalo más profundo de la muestra y al sur, oeste, norte y noroeste del área de estudio. En ciertos puntos aislados, el cadmio (hasta 1,68 mg/kg), el cromo (hasta 102 mg/kg), el plomo (hasta 182 mg/kg) y el vanadio (hasta 144 mg/kg) excedieron el criterio aplicable. Por lo general, la información recopilada definió de una manera más óptima los límites de los impactos del suelo y dejó en claro que la profundidad de dichos impactos es mucho mayor que la que fuera previamente estimada por las Partes[683].

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683 *Ibid*., pág. 92.

599. **Payamino 3**: dentro de las áreas estudiadas por Ramboll, los excesos de TPH que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de dos áreas principales[684]:

(a) Se delinearon los suelos del extremo meridional de la plataforma (no asociada con una CAR específica) mediante la obtención de muestras en las excavaciones PAY03-01 a PAY03-04. No se detectaron valores de TPH por encima del criterio de uso industrial use en ninguna de las muestras.

(b) Se caracterizó un acopio de suelo (no asociada con una CAR específica) en la excavación PAY03-05. La muestra obtenida para caracterizar esta acumulación con más detalle fue estudiada en búsqueda de TPH y metales. No se encontraron valores superiores al criterio de uso industrial de TPH ni de metales en ninguna de las muestras.

600. **Payamino 4 y 14/20/24**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de dos áreas principales[685]:

(a) Se delineó el área noreste de la plataforma de Payamino 4 (CAR 114; vertido histórico) mediante la obtención de muestras en las excavaciones PAY04-07 a PAY04-12. Se percibió olor a petróleo en los suelos subsuperficiales en las excavaciones PAY04-09, PAY04-10 y PAY04-12. No obstante, el TPH no excedió el criterio aplicable en ninguna de las muestras. El bario (hasta 5.810 mg/kg) excedió el criterio industrial aplicable en PAY04-12. El cadmio (hasta 2,08 mg/kg) y el plomo (hasta 120 mg/kg) también excedieron el criterio aplicable en este punto. El cromo (hasta 153 mg/kg) y el vanadio (hasta 181 mg/kg) excedieron el criterio aplicable en PAY04-10.

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684 *Ibid*., págs. 92-93.

685 *Ibid*., pág. 93.

(b) Se estudió el área sudoeste de la piscina de lodo (CAR 113), en donde se habían detectado las concentraciones de TPH más altas de todos los sitios en el suelo mediante un muestreo realizado por las Partes (124.873 mg/kg), mediante la obtención de muestras en las excavaciones PAY04-01 a PAY04-06. Se observó la presencia de lo que aparentaba ser crudo intemperizado en la superficie y se percibieron olor y manchas de petróleo en los suelos subsuperficiales de PAY04-01. No obstante, el TPH no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras. El bario (hasta 1.990 mg/kg) excedió el criterio aplicable en las regiones noroeste y sudoeste del área de estudio. El cadmio (hasta 4,9 mg/kg) también excedió el criterio aplicable al sur y sudoeste del área de estudio.

601. **Payamino 10**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: se delineó el bario presente en los suelos de la región sudoeste del área de la plataforma (no asociados con una CAR específica) mediante la obtención de muestras en las excavaciones PAY10-01 a PAY10-04172 puesto que el bario no excedió el criterio industrial en ninguna de las muestras. El vanadio (hasta 181 mg/kg) excedió el criterio aplicable en áreas al noroeste y al sur[686].

602. **Payamino 15**: dentro de las áreas estudiadas por Ramboll, los excesos de vanadio que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: se delineó el área este del anterior edificio de bombeo de combustible (no asociada con una CAR específica) mediante la obtención de muestras en las excavaciones PAY15-01 a PAY15-03. El vanadio no excedió el criterio industrial en ninguna de las muestras[687].

603. **Payamino 16**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo

686 *Ibid*., pág. 94.

687 *Ibid*., pág. 94.

adicional alrededor de un área principal: se delineó el bario presente en los suelos cercanos al pozo Payamino 16 (no asociados con una CAR específica) mediante la obtención de muestras en las excavaciones PAY16-01 a PAY16-03 puesto que el bario no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras. No obstante, el vanadio (hasta 143 mg/kg) excedió el criterio aplicable en todos los puntos de excavación[688].

604. **Payamino 21**: dentro de las áreas estudiadas por Ramboll, los excesos de TPH que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: se delineó el área noroeste del tanque de diésel (CAR 221; posible vertido del tanque de diésel) mediante la obtención de muestras en las excavaciones PAY21-01 a PAY21-04. El TPH no excedió el criterio industrial en ninguna de las muestras[689].

605. **Payamino 23**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: se estudió el área este de la plataforma (CAR 234; separador de vertidos de petróleo y agua) mediante la obtención de muestras en las excavaciones PAY23-01 a PAY23-07. Se percibió el olor y la mancha de petróleo en los suelos subsuperficiales en PAY23-01 y PAY23-02. No obstante, el TPH no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras. El bario (hasta 7.500 mg/kg) excedió el criterio aplicable en las regiones sur, este y norte del área de estudio. El vanadio (hasta 155 mg/kg) también excedió el criterio aplicable en todas las direcciones alrededor de esta área. En una región aislada, se detectaron niveles de plomo (hasta 89,6 mg/kg) por encima del criterio aplicable[690].

606. **Payamino WTS/LF**: dentro de las áreas estudiadas por Ramboll, los excesos de bario y TPH que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de tres áreas principales: se delinearon el TPH y el bario

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688 *Ibid*., págs. 94-95.

689 *Ibid*., pág. 95.

690 *Id.*

presentes en el suelo de las áreas norte, este y sur de la piscina de lodo (CAR 305) mediante la obtención de muestras en las excavaciones PAYWTS-01 a PAYWTS-06 puesto que ni el TPH ni el bario excedieron el criterio de uso industrial en ninguna de las muestras. No obstante, el vanadio (hasta 143 mg/kg) excedió el criterio aplicable en todos los puntos de excavación[691].

607. **Punino**: dentro de las áreas estudiadas por Ramboll, los excesos de TPH que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de tres áreas principales: se delineó el TPH presente en el área oeste de la plataforma (no asociada con una CAR específica; ubicada cerca del separador de vertidos de petróleo y agua) mediante la obtención de muestras en PUN01-01 a PUN01-04 puesto que el TPH no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras[692].

(ii) Bloque 21

608. Respecto del Bloque 21, las conclusiones de Ramboll fueron las siguientes[693]:

609. **Chonta**: dentro de las áreas estudiadas por Ramboll, los excesos de TPH al sur del sitio que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: el acopio del suelo y el área acumulada en las cercanías de la piscina de lodo 5 (CAR 281; supuestamente una piscina de lodo sin cerrar) se estudiaron mediante la obtención de muestras en las excavaciones CHON-01 a CHON-03. El olor y la mancha de petróleo se percibieron en los suelos subsuperficiales en CHON-02 y CHON-03, por lo que el análisis de TPH también se realizó sobre las muestras obtenidas en este sitio. No obstante, el TPH no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras. El bario (5.250 mg/kg) excedió el criterio aplicable en CHON-02. El cadmio (1,54 mg/kg) en CHON-01 y el níquel (63,9 mg/kg) en

691 *Ibid*., págs. 95-96.
692 *Ibid*., pág. 96.
693 *Ibid*., Sección 5.3.3.2.

CHON-03 también excedieron los criterios aplicables. El bario previamente detectado parece encontrarse en una porción limitada del acopio del suelo y los resultados de muestreo en las otras dos ubicaciones no parecen ser representativos del material de la piscina de lodo[694].

610. **Nemoca**: dentro de las áreas estudiadas por Ramboll, los excesos de TPH que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: se estudió el área sudoeste de la plataforma (no asociada con una CAR específica; ubicada cerca de un separador de vertidos de petróleo y agua) mediante la obtención de muestras en NEM01-01 a NEM01-05. El TPH no excedió el criterio de ecosistema sensible/residencial en ninguna de las muestras de Ramboll[695].

611. **Yuralpa A**: dentro de las áreas estudiadas por Ramboll, los excesos de bario que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de tres áreas principales: se estudió el área sudeste de la plataforma (no asociada con una CAR específica; ubicada cerca de un separador de vertidos de petróleo y agua) mediante la obtención de muestras en las excavaciones YURA-01 a YURA-05. Salvo por un exceso de bario (hasta 2.410 mg/kg) respecto del criterio aplicable al noreste del área estudiada, dicha área se encuentra ampliamente delineada[696].

612. **Yuralpa D**: dentro de las áreas estudiadas por Ramboll, los excesos de níquel que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: se delineó el níquel presente en los suelos adyacentes al pozo Yuralpa Pad D (CAR 291; posible vertido en el brocal) mediante la obtención de muestras en las excavaciones YURD-01 a YURD-04 puesto que el níquel no excedió el criterio industrial en ninguna de las muestras[697].

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694 *Ibid*., págs. 96-97.

695 *Ibid*., pág. 97.

696 *Id.*

697 *Ibid*., págs. 97-98.

613. **Yuralpa CPF**: dentro de las áreas estudiadas por Ramboll, los excesos de TPH que anteceden no se delinearon por completo, ni vertical ni horizontalmente. Tras un muestreo adicional alrededor de un área principal: se estudió el suelo debajo de un área de estacionamiento de grava en Yuralpa CPF (no asociada con una CAR específica) mediante un muestreo de las excavaciones YURCPF-01 a YURCPF-05. El TPH no excedió el criterio de uso industrial en ninguna de las muestras[698].

10. Requisitos de remediación

(a) Planes de remediación conceptual

614. El Sr. MacDonald identificó y evaluó alternativas potenciales de remediación de los suelos, las piscinas de lodo y las aguas subterráneas superficiales con referencia a los primeros cuatro criterios: demostrabilidad, viabilidad técnica, aceptación regulatoria y permanencia. A la luz de la caracterización específica de los sitios de los medios afectados, así como de otras condiciones ambientales, una tecnología de remediación se desestimaba si[699]:

(a) No era, en términos generales, aceptada por el TULAS o el RAOHE;

(b) No estaba bien establecida;

(c) Requería la instalación de una fuente de energía significativa, confiable y continua nueva;

(d) No era eficaz;

(e) Requería equipamiento especializado que no estuviere disponible localmente; o

(f) No cumpliría los requisitos de remediación.

615. Sobre la base de este proceso de análisis, el Sr. MacDonald formuló un ranking de las alternativas que calificaron teniendo en cuenta su efectividad a corto plazo (es decir, los riesgos para la salud humana y el ambiente durante la implementación de dichas remediaciones), la efectividad a largo plazo (es decir, los riesgos para la salud humana y el ambiente tras la implementación de la remediación), su implementabilidad (es decir, la

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698 *Ibid*., pág. 98.

699 *Ibid*., Sección 6.3.1.

facilidad, confiabilidad y flexibilidad de la implementación considerando las restricciones del sitio) y los costos asociados. Para cada criterio, las tecnologías se evaluaron comparándose entre sí y los resultados acumulativos finales fueron sopesados y comparados para definir las opciones preferidas (es decir, las alternativas con los resultados más altos). Las opciones de remediación preferidas por el Sr. MacDonald para cada medio se exponen en la Tabla 6.2 de su Informe, la cual se reproduce *infra*:

Tabla 6.2: Alternativas de remediación elegidas

Medios que requieren remediación	Alternativas de remediación que calificaron
Suelo (solo exceso de TPH)	Tratamiento *ex situ* (tratamiento superficial en tierra)[d] Excavación, tratamiento y contención en el sitio[d,e] Excavación, tratamiento y desecho fuera del sitio
Suelo (exceso de metal con o sin exceso de TPH)	Excavación, tratamiento y contención en el sitio[e] Excavación, tratamiento y desecho fuera del sitio
Piscinas de lodo	Tratamiento *in situ*[f] y taponado Rehabilitación/alineación de la piscina de lodo, desecho en el sitio y taponado (conforme al Artículo 59 del RAOHE)[g] Rehabilitación/alineación de la piscina de lodo, tratamiento del material[h], desecho en el sitio y taponado (conforme al Artículo 59 del RAOHE)[g] Excavación, tratamiento y desecho fuera del sitio
Aguas subterráneas	Sistema de bombeo y tratamiento[h] Barrera reactiva permeable[i]

Observaciones:

[a] *Ex situ* alude a la acción de remediación tras la remoción en un área designada o central.

[b] *In situ* alude a la acción de remediación en el sitio, sin necesidad de realizar excavaciones ni transporte a un sitio designado o área central.

[c] Se refiere a la ubicación dentro de las instalaciones o a una instalación cercana. Fuera del sitio significa una ubicación fuera de la instalación, perteneciente a un tercero.

[d] Esta alternativa podría incluir la fusión de los suelos afectados por el TPH en distintos sitios de un área central y su manejo como un solo medio.

[e] Esta alternativa podría incluir la fusión de los suelos que no califican y los materiales de las piscinas de lodo que no califican y su manejo como un solo medio.

[f] El tratamiento dentro del sitio solo hace referencia al agregado de cal en aras de ajustar el pH.

[g] Para materiales de las piscinas de lodo que no califican según el criterio de rendimiento no alineado, pero en cumplimiento del criterio de rendimiento alineado.

[h] El tratamiento de las piscinas de lodo podría incluir la mezcla de reactivos tales como cemento Portland, suelos de préstamo y/o cal.

[i] Esta alternativa solo es viable en aquellos sitios en los que continuamente hay presencia humana y en donde hay una fuente de energía disponible, además de medios para el almacenamiento y el tratamiento de aguas subterráneas extraídas.

[j] La barrera del reactivo permeable se encuentra típicamente ubicada en el lado de descenso de la gradiente de las áreas de aguas subterráneas afectadas. Sin embargo, a la luz del relativamente bajo potencial previsto para la migración de contaminantes en la mayoría de los sitios, dicho PRB no resultaría efectivo en el tratamiento de la contaminación de aguas subterráneas puesto que el PRB opera sobre la base de una corriente de agua suficiente a través del medio de reacción. Una variación de esta alternativa incluiría la ubicación de medios de reacción (para oxidar o reducir los contaminantes) en la base de las excavaciones propuestas para dichas áreas en donde el muestreo de aguas subterráneas ha detectado contaminación.

616. El Sr. MacDonald consideró que la selección de remediaciones conceptuales para los suelos se ajusta a lo dispuesto en el párrafo 4.1.3.6 y 4.1.3.7 del Anexo 2, Libro VI, del TULAS mientras que para las piscinas de lodo se ajusta a lo establecido en los Artículos 52(d)2.3 y 59(b) del RAOHE. Ellos definen a los enfoques de remediación generalmente aceptados por el Ministerio de Ambiente de Ecuador y establece un criterio de rendimiento específico. Además, para definir el enfoque de remediación conceptual, se consideraron los siguientes factores:

(a) Cada sitio fue analizado en su totalidad, de modo tal que el plan de remediación seleccionado aborde todos los medios afectados.

(b) El enfoque de remediación considerado para un área específica incluyó otras actividades de remediación en el sitio de modo tal que el menor número de tecnologías de remediación se implemente para simplificar la implementación.

(c) Si se tenía que remover el agua (es decir, de la excavación y de los suelos pantanosos), se asumía que se iban a utilizar y compartir dos sistemas de tratamiento de agua modulares y temporarios entre los sitios.

(d) Si se debían implementar acciones de remediación en áreas pantanosas que requerían la extracción de agua para poder construir en “condiciones secas” o para manejar el agua de superficie, se asumía que se iba a utilizar un sistema de represa temporal y reutilizable.

617. El Sr. MacDonald consideró que estos factores permitirían la optimización de los remedios y/o reduciría los costos de implementación.

(b) Estimaciones de costos

618. El Sr. MacDonald realizó entonces estimaciones de costos específicas de los sitios para las alternativas de remediación conceptuales en aras de abordar los medios afectados de cada sitio utilizando métodos de ingeniería estándares que incorporasen costos por unidad

locales, en caso de ser ello posible[700]. Las estimaciones de costos de remediación se realizaron, en su mayoría, de conformidad con las directrices de USEPA y USACE. Se detallan en el Apéndice I de su Informe. El Sr. MacDonald reconoció que la precisión de las estimaciones en la etapa de diseño de las remediaciones conceptuales sería menor que la de las estimaciones realizadas en etapas posteriores de diseño; no obstante, para la mayoría de los sitios, consideró que la información disponible era adecuada para realizar estimaciones razonables de costos de remediación para los planes de remediación específicos del sitio[701]. En aquellos casos en que la información fuere incompleta (es decir, en los que hubiere una delineación vertical y/u horizontal incompleta), se emplearon contingencias más altas para responder a la imprecisión del alcance.

619. Las cantidades utilizadas para el cálculo de los costos de remediación se definieron casi en su totalidad sobre la base de extensiones horizontales y verticales delineadas o inferidas de contaminación del suelo, dimensiones de piscinas de lodo mapeadas y proyección del perjuicio a las aguas subterráneas. En aquellos casos en los que se detectó contaminación pero no fue delineada ni caracterizada en su totalidad, el Perito utilizó estimaciones de remediación según su "orden de magnitud". Para ciertas actividades de remediación en donde las cantidades (es decir, el volumen de extracción de agua de la excavación, las cantidades de reactivo necesarias para cumplir los objetivos de remediación, la profundidad de las barreras de reactivo permeable, la configuración de la piscina de lodo), las propiedades del material (es decir, contenido o densidad del agua de los materiales excavados e índice de expansión y contracción de los materiales) o duración del proceso de tratamiento (es decir, cultivo de la tierra) no podían definirse por completo, estos factores fueron supuestos sobre la base de condiciones específicas de los sitios y la experiencia profesional del Perito con proyectos similares.

620. Las tasas de unidades de costos y producción utilizadas en las estimaciones de los costos de remediación se definieron a partir de una combinación de: (i) presupuestos realizados

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700 *Ibid*., Sección 6.3.3.

701 Estas estimaciones se basaron en las condiciones conocidas al momento de la redacción del Informe. Tras haber completado los estudios previos a la etapa de diseño y las actividades de diseño de remediación, resultó posible ajustarlas.

por contratistas de remediación de Ecuador; (ii) presupuestos realizados por proveedores de materiales de los Estados Unidos (es decir, reactivos) con experiencia en Ecuador; (iii) tasas de unidad verificadas previamente que fueron obtenidas por las Partes; y (iv) costos de unidad de remediación publicados en los Estados Unidos (por ejemplo, RS Means y RACER) ajustados mediante el uso de índices de ubicación. Mientras que algunos contratistas locales no proporcionaron presupuestos definitivos en ausencia de un alcance detallado del proyecto, detalles del sitio y de la posibilidad de visitar este último, el Sr. MacDonald creyó que la unidad de precio estimada que utilizó era adecuada para las proyecciones globales de costos. El sistema de precios de unidad utilizado en las estimaciones de costos incluía el trabajo, equipamiento, materiales, gastos generales y ganancias, salvo indicación en contrario.

621. En la realización de las estimaciones de los costos de remediación, el proceso de remediación fue subdividido en tareas grandes de construcción, que a su vez se subdividieron de manera pertinente:

(a) **Actividades de Pre-construcción:** incluyen actividades de estudio adicional pre-diseño para definir más claramente las cantidades de remediación y evaluar la extensión y magnitud de los impactos de las aguas subterráneas, los permisos en materia ambiental para permitir la implementación de las acciones de remediación propuestas y su diseño. Los costos asociados se asignaron de manera proporcional a las estimaciones de remediación de suelo, piscinas de lodo y aguas subterráneas[702].

(b) **Preparación del Sitio:** ello incluye, entre otros, el traslado de equipamiento y material para preparar los sitios para los trabajos de remediación. Los costos asociados se asignaron de manera proporcional a las estimaciones de remediación de suelo, piscinas de lodo y aguas subterráneas[703].

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[702] *Ibid.*, pág. 135.

[703] *Ibid.*, pág. 135.

(c) **Tratamiento de los Suelos *ex situ* – Cultivo de la Tierra :** el tratamiento de los suelos fuera del sitio mediante el cultivo de la tierra solo resulta aplicable a los suelos afectados por TPH y lleva, en última instancia, a rellenar los sitios tratados y restaurar las áreas afectadas[704].

(d) **Excavación del Suelo, Tratamiento y Desecho:** ello incluye actividades de excavación, tratamiento y desecho en las áreas que no tienen piscinas de lodo. Los materiales excavados se tratarían mediante estabilización/solidificación (es decir, mezclado con reactivos tales como cemento Portland, tierras de relleno y/o cal) si los suelos estuvieren afectados por metales (con o sin TPH) o solo por TPH[705].

(e) **Remediación de la Piscina de Lodo:** hay tres alternativas potenciales dependiendo del grado de cumplimiento de los criterios de rendimiento del RAOHE. Específicamente, (i) los materiales de la piscina de lodo que no cumplen los criterios de rendimiento de las piscinas de lodo alineadas se tratarían y ubicarían en piscinas de lodo alineadas reconstruidas, (ii) los materiales de la piscina de lodo que no cumplen con los criterios de rendimiento de las piscinas de lodo no alineadas exclusivamente se ubicarían en piscinas de lodo alineadas y reconstruidas, y (iii) los materiales de aquellas piscinas de lodo que no cumplieran con el criterio de pH no alineado del RAOHE se tratarían *in situ*. En todos los casos, la integridad de las piscinas de lodo cerradas tendría que asegurarse mediante un mantenimiento periódico (siega) y mediante el uso del área restringida de la piscina de lodo a través de la instalación de un muro perimetral si es que todavía no hubiere uno[706].

(f) **Remediación de las Aguas Subterráneas:** en las áreas en las que se ha detectado contaminación mediante el muestreo de suelo/piscinas de lodo y aguas subterráneas, las actividades de remediación de aguas subterráneas se complementan con actividades de remediación de suelo o piscinas de lodo. En los pocos casos en los que hay posibilidad de un grado más alto de migración de

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704 *Id.*

705 *Ibid.*, págs. 135-136.

706 *Ibid*, pág. 136.

contaminantes de las aguas subterráneas, la remediación de estas últimas consistiría en la instalación de una barrera reactiva permeable. Este tratamiento pasivo de aguas subterráneas no requeriría operación ni mantenimiento pero sí requeriría un monitoreo periódico para documentar la efectividad del sistema de tratamiento[707].

(g) **Gestión de la Construcción**: esto se relaciona con el control y la documentación de las acciones de remediación y los informes del trabajo realizado. Los costos asociados se asignaron de manera proporcional a las estimaciones de remediación del suelo, piscinas de lodo y aguas subterráneas[708].

(h) **Contingencia:** los costos de contingencia se definieron sobre la base de cuán bien se podría definir y puntuar del 10% al 30% el alcance del remedio propuesto dependiendo de su complejidad y certeza. Dichos costos se asignaron de manera proporcional a las estimaciones de remediación del suelo, piscinas de lodo y aguas subterráneas[709].

(i) **Costos Recurrentes:** incluyen los costos de mantenimiento a largo plazo y de monitoreo, aplicados tras la implementación de la remediación. Algunos remedios requerirían inspecciones físicas diarias y mantenimiento del sitio. En el caso de remedios de aguas subterráneas, se ha considerado la posibilidad de un monitoreo de aguas subterráneas anual por un plazo de 10 años para documentar la efectividad del tratamiento. Mientras que las actividades de mantenimiento del tapón se requerirán de manera perpetua, a los efectos de la estimación, estos costos se han proyectado por un período de 30 años[710].

622. Además, sobre la base de la experiencia de contratistas locales que han realizado trabajos de remediación recientemente en nombre de Petroamazonas en la región, se aplicó un multiplicador por tres a cinco de los costos de trabajo a esos proyectos en aras de cumplir

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707 *Id.*

708 *Ibid.*, pág. 136.

709 Informe del Perito Independiente, pág. 136.

710 *Ibid.*, pág. 137.

con los requisitos de salud, seguridad y de relaciones con la comunidad impuestos por Petroamazonas, que afectan la productividad y la efectividad de los trabajos de remediación. Dicho factor también responde por el potencial de seguridad adicional necesaria para la implementación del trabajo. En ausencia de un desglose de costos detallado o de plazos definidos para las actividades de construcción, Ramboll no pudo determinar de manera confiable el grado en el que debería aplicarse dicho factor a sus estimaciones de los costos de remediación. Ramboll estimó que este factor podría verse parcialmente compensado por las contingencias aplicadas y por las premisas conservadoras que se emplearon para definir las cantidades de remediación[711]. Las cantidades y los costos se exponen en las Tablas 6.3 a 6.10 del Informe del Perito Independiente.

(c) Síntesis de las estimaciones de costos

623. Respecto de los planes de remediación conceptual y de los posibles métodos viables de remediación y sus costos asociados, el Sr. MacDonald consideró que las estimaciones de los probables costos de remediación para los planes de remediación específicos del sitio eran razonables.

624. Sobre la base de estos planes de remediación conceptual, Ramboll desarrolló estimaciones de costos específicas de los sitios mediante el empleo de métodos estándares de estimación de costos y de conformidad, en términos generales, con las directrices USEPA y USACE[712]:

(a) Las cantidades de remediación se definieron, en su mayoría, sobre la base de extensiones horizontales y verticales de contaminación del suelo, ya sea delineadas o inferidas, dimensiones de las piscinas de lodo mapeadas y en el grado de afectación previsto de las aguas subterráneas. En los casos en los que se identificaron impactos pero estos últimos no fueron completamente delineados o caracterizados, se proporcionaron estimaciones de la remediación según su orden de magnitud.

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711 *Id.*

712 Informe del Perito Independiente, pág. 150.

(b) Para ciertas cantidades de remediación o propiedades de los materiales, se hicieron inferencias sobre la base de las condiciones específicas del sitio y de la experiencia profesional en proyectos similares.

(c) Las tasas de producción y los costos de las unidades utilizados en las estimaciones de costos de remediación se definieron sobre la base de una combinación de: (a) presupuestos emitidos por contratistas de remediación de Ecuador; (b) presupuestos emitidos por proveedores de materiales de los Estados Unidos con experiencia en Ecuador; (c) tasas de unidad verificadas previamente obtenidas por las Partes; y (d) costos de unidades de remediación publicados en los Estados Unidos (por ejemplo, RS Means o RACER), ajustados mediante índices locales.

(d) En el caso de sitios complejos (por ejemplo, presencia de tuberías subterráneas, pendientes profundas, acceso limitado, trabajo con pantanos), se aplicaron contingencias más altas para dar cuenta de la incertidumbre del alcance.

625. Estas se exponen en la Tabla 6.11 de su Informe de Perito Independiente:

Tabla 6.11: Síntesis de las estimaciones de los costos de remediación

Sitio	Costo de remediación estimado			
	Suelos	Piscinas de lodo	Agua subterránea	Total
Coca 01	USD 788	-	-	USD 788
Coca 02, CPF	USD 2.700	-	USD 3.001	USD 5.701
Coca 04	USD 308	-	-	USD 308
Coca 06	USD 5.223	-	-	USD 5.223
Coca 08	USD 10.055	-	-	USD 10.055
Coca 09	USD 805	-	-	USD 805
Coca 10, 16	USD 781	-	-	USD 781
Coca 18, 19	USD 406	USD 3.123	-	USD 3.529
Cóndor Norte	USD 6.339	USD 2.484	-	USD 8.823
Gacela 01, CPF	USD 2.103	-	USD 1.397	USD 3.500
Gacela 02	USD 1.575	-	USD 597	USD 2.172
Gacela 04	USD 195	-	-	USD 195
Gacela 05	USD 247	-	-	USD 247
Jaguar 01	USD 3.104	-	USD 438	USD 3.542
Jaguar 02	USD 8.505	-	USD 1.173	USD 9.678
Jaguar 03	USD 5.643	-	-	USD 5.643
Jaguar 05, CPF	USD 379	-	-	USD 379

Tabla 6.11: Síntesis de las estimaciones de los costos de remediación				
Sitio	Costo de remediación estimado			
	Suelos	Piscinas de lodo	Agua subterránea	Total
Jaguar 07, 08	USD 323	-	-	USD 323
Jaguar 09	-	USD 541		USD 541
Lobo 01	USD 1.361	-	-	USD 1.361
Lobo 03	-	USD 101	-	USD 101
Lobo 04	USD 717	-	-	USD 717
Mono CPF	USD 15.773	-	USD 5.030	USD 20.803
Mono Sur	USD 1.281	-	-	USD 1.281
Oso 01, CPF	USD 186	-	-	USD 186
Oso 03	-	USD 1.906	-	USD 1.906
Oso 09	-	USD 5.317	USD 3.415	USD 8.732
Oso 09A	-	USD 2.948	-	USD 2.948
Oso 09B	-	USD 1.507	-	USD 1.507
Oso A	USD 228	-	-	USD 228
Payamino 01, CPF	USD 4.746	-	USD 1.404	USD 6.150
Payamino 02, 08	$15.316	-	USD 4.343	USD 19.659
Payamino 03	USD 110 – USD 129	-	-	USD 110 – USD 129
Payamino 04, 14	USD 3.411	-	USD 1.611	USD 5.022
Payamino 10	USD 313	-	-	USD 313
Payamino 13	-	-	USD 1.166	USD 1.166
Payamino 15	-	-	USD 1.166	USD 1.166
Payamino 16	-	-	-	
Payamino 21	USD 155	-	-	USD 155
Payamino 23	USD 1.765	-	-	USD 1.765
Payamino WTS	USD 1.493	USD 2.978	-	USD 4.471
Punino	USD 121	-	-	USD 121
Chonta	USD 645	USD 1.404	-	USD 2.049
Nemoca	USD 530	-	-	USD 530
Yuralpa A	USD 202	USD 1.034	-	USD 1.236
Yuralpa CPF	USD 98	-	-	USD 98
Yuralpa D	USD 475	-	-	USD 475
Yuralpa E	-	USD 193	-	USD 193
Yuralpa G	-	USD 963	-	USD 963
Yuralpa LF	-	USD 12.217	-	USD 12.217
TOTAL	**USD 98.423**	**USD 36.715**	**USD24.742**	**USD 159.881**

Observaciones:

1. En esta tabla de síntesis, se utilizaron los valores más altos de los costos en los casos de Nemoca, Payamino 21, Punino, Yuralpa CPF y Yuralpa LF.

[Traducción del Tribunal]

11. Opiniones sobre las conclusiones técnicas de los bloques

626. Las conclusiones clave del Sr. MacDonald y las opiniones relativas a las conclusiones técnicas comprensivas de los Bloques son las siguientes[713]:

(a) El trabajo de campo realizado por Ramboll contribuyó significativamente al cuerpo de conocimiento y la plataforma técnica sobre la contaminación en los sitios de los Bloques 7 y 21 y sirve como una base confiable para efectuar una estimación de costos independiente e imparcial.

(b) El estudio completo de las piscinas de lodo demuestra que un amplio porcentaje de las piscinas de lodo en los Bloques no cumple los estándares de rendimiento del RAOHE y requiere remediación.

(c) La información representativa obtenida de todas las plataformas estudiadas en los Bloques demuestra que las aguas subterráneas se han visto afectadas por operaciones de campos de petróleo y requieren remediación.

(d) El estudio exhaustivo de los suelos definió adecuadamente el grado del impacto de los yacimientos de petróleo en los Bloques que requieren remediación. La información recabada fue suficiente para definir razonablemente las cantidades de remediación.

(e) Las herramientas analíticas y los principios rectores utilizados para definir los requisitos de remediación específicos del medio resultan consistentes con las regulaciones de Ecuador, las prácticas profesionales y las instrucciones del Tribunal.

(f) Las opciones de remediación para los medios afectados fueron estudiadas de manera sistemática para preseleccionar alternativas disponibles localmente,

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713 *Ibid.*, Sección 7.

probadas, implementables y con una buena relación costo-beneficio que se adapten a los enfoques de remediación generalmente aceptados que se describen en el TULAS o el RAOHE. Las opciones de remediación se agruparon en planes de remediación conceptuales para cada sitio en aras de abordar el medio afectado. Las estimaciones de los costos de remediación asociados se realizaron mediante la utilización de métodos estándares de estimaciones de costos que incorporan costos de unidades de contratistas locales, costos de unidades publicados ajustadas sobre la base de índices de ubicación.

E. Los comentarios de las partes

627. Con posterioridad a la trasmisión del Informe del Sr. MacDonald a las Partes, el Tribunal autorizó a las Partes a que realizaran dos tipos de presentaciones escritas sobre el Informe, a que se solicitaran determinados documentos entre ellas, y a que realizaran presentaciones orales y formularan preguntas al Perito en la audiencia de dos días que fuera celebrada en La Haya el 11 y 12 de marzo de 2019.

628. En cuanto a los documentos escritos, se instruyó a las Partes para que comentaran el Informe del Perito Independiente enfocándose en cada parte principal de este último. Así pues, sus comentarios fueron insertados en un “Informe Pericial Consolidado”. Además, se invitó a las Partes a que presentaran comentarios generales respecto del Informe en una presentación escrita separada cuya extensión no excediera las 30 páginas.

629. Tras la presentación de estos documentos el 22 de febrero de 2019, estos fueron trasmitidos al Sr. MacDonald para que los revise. El Día 1 de la Audiencia Pericial, el Sr. MacDonald dio una presentación de 90 minutos ante las Partes y el Tribunal, en la que explicó sus conclusiones clave y respondió los comentarios escritos de las Partes. Tras dicha presentación, las Partes contaron con 2 horas cada una para contrainterrogarlo.

630. Luego se celebró una conferencia de testigos en la que el Sr. MacDonald fue agrupado, primero, con un representante de IEMS y después con uno de GSI. Cada Parte tuvo la oportunidad de formular preguntas a ambos peritos. Durante el Día 2, se permitió nuevamente a las Partes que formularan preguntas al Sr. MacDonald y luego que efectuaran presentaciones de cierre sobre el trabajo del Perito Independiente.

1. Comentarios de Ecuador sobre las conclusiones de los peritos independientes

631. Ecuador observó que el Sr. MacDonald se limitó a una sola campaña de muestreo para "lagunas en los datos", de conformidad con las instrucciones del Tribunal[714]. En opinión de Ecuador, el Perito Independiente empleó las mejores prácticas actuales de la industria durante su campaña de campo. Su Informe confirma la posición de Ecuador de que Perenco produjo un importante daño ambiental extendido en los Bloques 7 y 21, y que Perenco no fue un operador diligente y prudente que haya cumplido plenamente con las normativas ambientales ecuatorianas[715]. El Sr. MacDonald ha llenado lagunas de información significativas y ha estimado volúmenes y costos de remediación y costos de dicha contaminación más altos que los estimados por los peritos de Perenco y ha efectivamente reivindicado la posición de Ecuador de que la contaminación se extiende más allá de los puntos de muestra y que el uso del software de modelado predictivo (tal como fuera usado por IEMS) para estimar la extensión completa de la contaminación de los Bloques estaba justificado[716].

632. En consideración de las conclusiones del Sr. MacDonald y sobre la base de la nueva información disponible, Ecuador actualizó sus reclamaciones respecto de los sitios en los que el Sr. MacDonald ha confirmado volúmenes y costos de remediación adicionales en comparación con su "caso regulatorio"[717]:

(a) <u>Costos de remediación del suelo:</u>

i. Coca 10/16: al menos USD 781.000;
ii. Jaguar 1: al menos USD 3.104.000;
iii. Jaguar 5/CPF: al menos USD 379.000;
iv. Lobo 4: al menos USD 717.000;
v. Oso A: al menos USD 228.000;
vi. Payamino 23: al menos USD 1.765.000; y
vii. Yuralpa F/CPF: al menos USD 98.000.

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714 Comentarios de Ecuador sobre el Informe del Perito Independiente de 22 de febrero de 2019, párr.4.

715 *Ibid.*, párr.1.

716 *Ibid.*, párr. 9.

717 *Ibid.*, párr.31. [Traducción del Tribunal]

(b) Costos de remediación del agua subterránea:

i. Mono CPF: al menos USD 5.030.000;
ii. Oso 9: al menos USD 3.415.000; y
iii. Payamino 2/8: al menos USD 4.343.000.

633. Al mismo tiempo, Ecuador sostuvo que el Sr. MacDonald no captó la magnitud total de la contaminación causada por Perenco, y solo ha estimado las necesidades de remediación mínimas que surgen de lo que denominó como las "*operaciones imprudentes de* Perenco"[718]. Los comentarios de Ecuador respecto de los aspectos específicos del estudio del Sr. MacDonald se exponen *infra*.

(a) Suelos

634. Ecuador opina que el estudio de la contaminación del suelo del Sr. MacDonald, en términos generales, cumple las instrucciones impartidas por el Tribunal[719].

635. *En primer lugar*, el Sr. MacDonald limitó la campaña de muestreo a las áreas previamente muestreadas. Puesto que Perenco critica al Sr. MacDonald por desarrollar actividades de muestreo fuera de lo que se le encomendó, Ecuador sostiene que se cumplió la instrucción del Tribunal de que "*[e]n la medida en que las áreas circundantes a los puntos de contaminación no hayan sido delineadas […]icho proceso de delineación deberá llevarse a cabo en este momento*"[720] puesto que el Sr. MacDonald mantuvo a una distancia aproximada de unos 10 a 15 metros con respecto a las muestras de las Partes en su tarea de obtener muestras adicionales en un acopio del suelo a unos pocos metros al este de las piscinas auxiliares de Perenco (que se encuentran contaminadas) en Coca 18/19[721].

636. *En segundo lugar*, en opinión de Ecuador, el hecho de que el Sr. MacDonald se haya basado en muestras discretas del suelo (de intervalos inferiores a 0,3 m) al efecto de la delineación, le permitió al perito captar las concentraciones más altas de contaminantes dentro de cada

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718 *Ibid.*, párr. 4. [Traducción del Tribunal]
719 *Ibid.*, párr. 10.
720 *Ibid.*, párr. 11 y nota al pie 33, que hace referencia a la Decisión Provisional, párr. 601.
721 *Ibid.*, párr. 11.

intervalo de muestra. Ello resultó en volúmenes de remediación más altos, en contraste con los compuestos verticales de 1 metro de GSI, que subestimaron la contaminación mediante la dilución.

637. Ecuador observa que el Sr. MacDonald ajustó los criterios aplicables para responder por los niveles de metales de fondo en aquellos casos en los que había concentraciones de metales pesados naturales. Ello resultó en la exclusión de cientos de muestras de las Partes, así como de las propias muestras de delineación del Sr. MacDonald, que revelaron la presencia de excesos en los límites de vanadio y cadmio por encima de los umbrales especificados en el RAOHE y en el TULAS[722].

638. En cuanto a la clasificación del uso de los suelos, Ecuador defiende la metodología del Sr. MacDonald respecto de las críticas de Perenco:

(a) En primer lugar, contrariamente a las críticas de Perenco de que el Sr. MacDonald se basó en inspecciones visuales para las designaciones del uso del suelo, ello no fue así[723]. En cualquier caso, los propios peritos de Perenco limitaron sus análisis de las designaciones del uso del suelo a la inspección visual[724].

(b) En segundo lugar, Perenco no puede culpar al Sr. MacDonald por prestar atención al uso real del suelo puesto que esa constituyó la defensa de Perenco desde un principio[725].

639. No obstante, el propio Ecuador planteó varias críticas a las estimaciones de la remediación del suelo del Sr. MacDonald.

640. *En primer lugar,* si bien Ecuador reconoce que los lineamientos del Sr. MacDonald para la clasificación del uso del suelo coincidían en líneas generales con las instrucciones del

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722 *Ibid.*, párr. 13.

723 Tr. (2) (MacDonald) (12 de marzo de 2019), 392:8-14; Alegato de Clausura de Ecuador, Diapositiva 15.

724 Tr. (2) (MacDonald) (12 de marzo de 2019), 392:15-393:4, que hace referencia a la página C36 del Apéndice C del GSI ER I.

725 Tr. (2) (MacDonald) (12 de marzo de 2019), 393:5-19.

Tribunal de aplicar designaciones del uso del suelo más estrictas, Ecuador sostiene que sus clasificaciones para ciertas áreas fueron muy permisivas. Ecuador cita como ejemplos el área al noreste de la plataforma en Payamino 4, que se había reclasificado como "industrial", y la clasificación de Coca 1 y Gacela 1/8 como "agrícola", aunque el Consorcio y los operadores anteriores reconocieron que las áreas de interacción de agua eran muy "sensibles"[726]. Ecuador sostiene asimismo que Lobo 1 debería remediarse conforme a un estándar de ecosistema sensible, no agrícola, puesto que fue abandonado por Perenco y no había sido operado por Petroamazonas, y que esto coincidiría con el enfoque de remediación del Sr. MacDonald para otras plataformas que no han sido operadas desde su abandono por parte de Perenco.

641. *En segundo lugar*, Ecuador critica la exclusión del Sr. MacDonald de los tres sitios en los que se identificaron valores de suelo por encima del criterio regulatorio aplicable: las muestras de Lobo 2 y Payamino 5 revelan excesos de bario y las de Payamino 19 revelan excesos de TPH[727]. El Sr. MacDonald excluyó asimismo de sus estudios otros siete sitios sobre la base de que Perenco no había perforado en dichos sitios y de que no se identificaron piscinas asociadas a Perenco. No obstante, Ecuador sostiene que no puede desestimarse que Perenco había realizado actividades en estos sitios y que deberían haber seguido estudiándolos[728]. Ecuador también sostiene que el Sr. MacDonald debería como mínimo haber realizado una delineación en virtud de órdenes de magnitud[729].

642. *En tercer lugar*, la delineación del suelo del Perito Independiente estaba incompleta. La delineación completa solo se llevó a cabo en 12 sitios. Ecuador señala que el Sr. MacDonald reconoció este hecho en su Informe así como en la Audiencia Pericial de marzo de 2019[730]. En aras de identificar la extensión total de la contaminación vertical y horizontal, debería proseguirse con el muestreo hasta que se encuentre 'suelo limpio'; no

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726 Comentarios de Ecuador en la Sección 3.1 del Informe del Perito Independiente, párr. 6.

727 *Ibid.*, párr. 34 y nota al pie 88.

728 Comentarios de Ecuador a la Sección 4.2 del Informe del Perito Independiente, párr. 1, en referencia a los Comentarios de Ecuador de la Hoja de Datos de las Piscinas de Lodo de fecha 22 de setiembre de 2017.

729 Alegato de Clausura de Ecuador, pág. 13.

730 Alegato de Clausura de Ecuador, pág. 16, que hace referencia a la Tr. (1) (MacDonald) (11 de marzo de 2019), 248:14-16.

obstante, 239 de las 804 muestras obtenidas por el Sr. MacDonald no eran 'limpias'. El Sr. MacDonald, en cambio, estimó los límites de la contaminación sobre la base de información existente y de las condiciones de los límites, así como de las observaciones de campo. Un ejemplo de dicha delineación incompleta se puede encontrar en Coca 8, en donde el muestreo del Sr. MacDonald todavía encontró contaminación y en donde este último asumió un promedio de 3 metros de profundidad para la remediación incluso aunque reconoció que los excesos se habían detectado en profundidades de hasta 4,5 metros[731].

643. Por último, Ecuador criticó la decisión del Sr. MacDonald de estimar "órdenes de magnitud" para la remediación en aquellos casos en los que la información resultare insuficiente [Traducción del Tribunal]. No había garantía de que estas estimaciones capturasen toda la contaminación presente en dichas áreas. Una vez más, Ecuador se basó en Coca 8 para tomar un ejemplo cuando no había motivo para creer que la estimación del Sr. MacDonald capturaba toda la contaminación de manera apropiada.

(b) Piscinas de lodo

644. Ecuador observó que, contrariamente al argumento de Perenco de que había empleado consistentemente buenas prácticas con respecto a las piscinas de lodo, el Perito determinó que los contenidos de 34 a 38 muestras de las piscinas de lodo asociadas a Perenco no cumplían con los criterios establecidos en el RAOHE. Los 12 sitios estudiados tenían al menos una piscina de lodo que no cumplía con los estándares de degradación y 11 de esos sitios también tenían al menos una piscina de lodo con material de cobertura inadecuado[732].

645. Con respecto a la decisión del Sr. MacDonald de tomar muestras en las piscinas fuera de los sitios en Oso 9A y 9B, la cual fuera criticada por Perenco bajo el argumento de que ello se encontraba fuera del alcance de lo que se le había encomendado, Ecuador sostuvo que fue correcto hacerlo. La decisión del Sr. MacDonald de tomar muestras de estas piscinas fue congruente con lo que se le había encomendado por tres motivos: en primer lugar, ese área de la piscina había sido muestreado previamente en 2010 por IEMS; en segundo lugar,

731 Comentarios de Ecuador sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 38.

732 *Ibid.*, párr. 16.

Perenco reconoció haber desarrollado tareas de acondicionamiento en Oso 9 y haber perforado pozos en las cercanías y no negó haber utilizado dichas piscinas; y en tercer lugar, GSI hizo referencia al muestreo desarrollado por Perenco al momento del supuesto cierre de dichas piscinas[733].

646. Ecuador afirmó que el Sr. MacDonald verificó adecuadamente la conformidad de todas las piscinas de lodo con las muestras de degradación respecto de los criterios de la Tabla 7 del RAOHE mediante el test de degradación de TCLP especificado por en el RAOHE. Si bien el Sr. MacDonald también utilizó el método SPLP para "*analizar […] cualitativamente el potencial de degradación in-situ de los componentes detectados en los materiales de las piscinas de lodo*", no se basó en los resultados de SPLP, tal como lo hiciere GSI "de manera inadecuada" [Traducción del Tribunal], para analizar la conformidad con el RAOHE[734].

647. Ecuador también sostuvo que la decisión del Sr. MacDonald de tratar todas las piscinas como si no estuvieren alineadas estaba justificada, puesto que constituían caminos de exposición debido a su profundidad y a la superficialidad de su nivel freático (es decir, aguas subterráneas poco profundas). Esto fue aun más relevante considerando la falta de evidencia de revestimientos en las piscinas, tal como señalara el Sr. MacDonald[735]. Ecuador recordó que GSI había admitido que "*no realizó un ensayo separado de la presencia o ausencia de revestimientos sintéticos*"[736]. Incluso si Perenco hubiese instalado revestimientos (lo cual no se ha probado), no hubo certeza alguna de que dichos revestimientos se extendieren en su totalidad bajo las piscinas y permanecieran intactos. En efecto, los propios empleados de Perenco declararon que el Consorcio fue descuidado al depositar lodos de perforación de modo tal que los revestimientos se resquebrajaran debido a las altas temperaturas[737].

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733 *Ibid.*, párr. 18.

734 *Ibid.*, párr. 19.

735 *Ibid.*, párr. 20 y nota al pie 58.

736 *Ibid.*, párr. 20 y nota al pie 59. [Traducción del Tribunal]

737 *Ibid.*, párr. 20.

648. Además de la cuestión de los revestimientos, Ecuador hizo varias críticas al estudio de las piscinas de lodo del Sr. MacDonald.

649. *En primer lugar,* el Sr. MacDonald excluyó de su estudio piscinas de lodo de 30 sitios, que había estudiado sobre la base de que no se había detectado su uso por parte de Perenco[738]. No obstante, hay pruebas de que Perenco podría haber generado lodo de perforación y/u otros desechos en estos sitios, lo que indica que Perenco debe haber usado estas piscinas de lodo, o que Perenco no logró probar que estas piscinas de lodo se habrían cerrado adecuadamente. Por consiguiente, debería haberse continuado el estudio de dichas piscinas de lodo. Según Ecuador, especialmente esto debió haber sido así teniendo en cuenta la práctica de Perenco de construir y utilizar piscinas no reportadas (tal como fuera admitido por el Sr. Saltos ante el tribunal de *Burlington*) que nunca fueron aprobadas o siquiera conocidas por las autoridades ecuatorianas[739].

650. *En segundo lugar,* incluso dentro de los 38 sitios que se estudiaron, es probable que las concentraciones detectadas en los contenidos de las piscinas de lodo por el Sr. MacDonald se hayan subestimado. Además, dada la incertidumbre relativa a las dimensiones reales de las piscinas estudiadas, tales dimensiones tuvieron que ser estimadas y el Sr. MacDonald tuvo que proceder con cautela en la actividad de muestreo para así no "perforar el fondo de la piscina de lodo"[740], lo que sugiere que las piscinas podrían haber sido, en efecto, más profundas. Además, en los casos en que la profundidad de las piscinas de lodo no estaba disponible en los registros, el Sr. MacDonald asumió una profundidad de solo 3,5 metros sobre la base del promedio de profundidad proporcionado en determinados expedientes de cierre de piscinas de lodo. La evidencia disponible sugiere que esta suposición, sin embargo, resulta insuficiente para responder por todas las piscinas que requieren remediación. Por ejemplo, en Coca 18-19, 4 piscinas construidas por Perenco tenían 4,5 metros de profundidad.

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738 Comentarios de Ecuador a la Sección 4.2 del Informe del Perito Independiente, párr. 2, que hace referencia a la Tabla 4.3 del Informe.

739 Comentarios de Ecuador al Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 43.

740 Informe del Perito Independiente, pág. 48. [Traducción del Tribunal]

(c) Aguas subterráneas

651. Ecuador señala que, contrariamente a la conclusión de GSI de que no hay contaminación en las aguas subterráneas de los Bloques, estas últimas se vieron afectadas por las operaciones de los campos de petróleo y excedieron el criterio de TPH del TULAS y/o del bario en los 12 sitios estudiados por el Sr. MacDonald. Ello confirma que las aguas subterráneas se vieron afectadas negativamente por las operaciones de los campos de petróleo de Perenco y requiere remediación.

652. La campaña de muestreo de las aguas subterráneas del Sr. MacDonald –que, según las observaciones de Ecuador fue monitoreada por los peritos de ambas Partes– cumplió los más altos estándares de la industria, tal como lo confirmara el hecho de que sus resultados son uniformes en todas las muestras obtenidas mediante distintos métodos de muestreo (bajo flujo y tomadores de muestras pasivos de Polietileno Poroso Rígido)[741]. El Sr. MacDonald desarrolló su muestreo mediante los pozos de monitoreo permanente, instalados de conformidad con las mejores prácticas de la industria y analizó los resultados de las muestras en comparación con los criterios del TULAS. Ecuador sostiene que el Sr. MacDonald revindica las críticas de IEMS respecto de las tácticas de evasión de GSI respecto de la confirmación de los impactos en las aguas subterráneas de los Bloques[742].

653. *En primer lugar*, Ecuador considera que las ubicaciones de los pozos de monitoreo de aguas subterráneas del Sr. MacDonald cumplían con las instrucciones del Tribunal. Al sostener que la teoría detrás del muestreo no se adaptaba a dichas instrucciones, Perenco efectúa una interpretación incorrecta de las instrucciones y el objetivo perseguidos. Tal como lo explicara el Perito, "*la duplicación exacta del programa implementado previamente por las Partes habría arrojado un conjunto de datos insuficiente que no serviría al efecto de los objetivos del Tribunal [y] además, su costo de implementación sería el triple*"[743]. Además, solo dos pozos de monitoreo, en Payamino 1 y Jaguar 2, no son inmediatamente

741 *Ibid.*, párr. 22.

742 *Ibid.*, párr. 22.

743 *Ibid.*, párr. 25 y nota al pie 70, que hace referencia a la carta del Sr. MacDonald a Perenco de 28 de diciembre de 2017, pág. 3, E-453. [Traducción del Tribunal]

adyacentes al anterior pozo de monitoreo de IEMS o GSI –y los ajustes de estas ubicaciones de los pozos se encuentran justificados debido a las altas concentraciones de TPH en los suelos de Payamino 1 y de crudo de estación intemperizado en Jaguar 2[744]. En cualquier caso, el impacto en las aguas subterráneas también se detectó en ambos sitios en los pozos de monitoreo que fueron instalados en las cercanías de los pozos de monitoreo de IEMS y de GSI, de modo tal que las aguas subterráneas requieren remediación independientemente de los resultados de los pozos de monitoreo cuya ubicación fuera criticada por Perenco[745].

654. *En segundo lugar*, Ecuador observa que el Sr. MacDonald instaló 34 pozos de monitoreo permanentes de avanzada con pantalla y pre-empacados en consonancia con la práctica industrial actual de "*tratar las condiciones subsuperficiales de granos finos que se encuentra típicamente en Región Oriente de Ecuador"* y "*mejorar la calidad de la muestra mediante la reducción de su turbidez y garantizar que las muestras obtenidas del pozo sean representativas de las aguas subterráneas"*[746]. El Sr. MacDonald, asimismo, tomó varias precauciones para prevenir la contaminación por filtración de aguas superficiales. El argumento de Perenco de que la potencial incrustación de la contaminación del suelo en los pozos de monitoreo a través de las aguas superficiales contradice lisa y llanamente la posición de GSI con respecto a la impermeabilidad de los suelos de arcilla en el área[747].

655. *En tercer lugar*, Ecuador observa, asimismo, que el Sr. MacDonald midió los hidrocarburos presentes en las muestras de aguas subterráneas de conformidad con el TULAS y consideró debidamente –en consonancia con el enfoque de IEMS– las cantidad de concentración de

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744 *Ibid.*, párr. 25 y nota al pie 72: carta del Sr. MacDonald a Perenco de 28 de diciembre de 2017, pág. 4 (PAY01-MW03 y JAG02-MW03 "se instalaron en áreas de donde las Partes habían obtenido muestras del suelo con anterioridad y mediante las que se detectaron altos niveles de contaminación en el suelo, pero en las que no se habían instalado pozos con anterioridad […]. La presencia de crudo también resultaba evidente en JAG02-MW03. La falta de información analítica de aguas subterráneas dentro de estas dos áreas contaminadas representaría una laguna de información significativa que limitaría mi capacidad de evaluación para determinar si la contaminación de las aguas subterráneas se encontraba presente en estos dos sitios afectados" [Traducción del Tribunal]), E-453.

745 *Ibid.*, párr. 25.

746 Comentarios de Ecuador sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 26 y notas al pie 74-75, que hacen referencia al Informe del Perito Independiente, págs. 66 y 68. [Traducción del Tribunal]

747 *Ibid.*, párr. 26.

GRO, DRO y ORO (en las que GSI comparó las fracciones de manera individual con el límite del TULAS)[748].

656. *En cuarto lugar*, Ecuador sostiene que la decisión del Sr. MacDonald de no filtrar las muestras de aguas subterráneas que habían sido obtenidas mediante tomadores de muestras pasivos de Polietileno Poroso Rígido (RPP, por sus siglas en inglés) y técnicas de muestreo de bajo flujo. Sin perjuicio de las objeciones de Perenco, la decisión del Sr. MacDonald de no filtrar las muestras fue posteriormente corroborada con resultados analíticos similares para metales en muestras pasivas y de bajo flujo[749].

657. *En quinto lugar*, la decisión del Sr. MacDonald de no excluir la remediación de aguas subterráneas sobre la base del contenido de arcilla del suelo es respaldada por el TULAS. Las normativas ecuatorianas no impiden la remediación de aguas subterráneas en suelos con un contenido de arcilla superior al 25% y de materia orgánica superior al 10% [750]. En cualquier caso, no hay información disponible relativa a la materia orgánica en las muestras, por lo que las condiciones acumulativas no se cumplirían. La decisión del Sr. MacDonald está justificada por el hecho de que pudo extraer aguas subterráneas de todos los pozos de monitoreo, y confirmar que la presencia de arcilla en el suelo (incluso mayor que el 25%) no los impermeabiliza. Ello confirma la alta probabilidad de que las aguas subterráneas contaminadas se estén utilizando por comunidades cercanas para beber y la necesidad de asegurar que dichas aguas sean remediadas adecuadamente[751].

658. En su alegato de clausura, Ecuador sostuvo que el argumento de Perenco relativo a que el contenido de arcilla en el suelo por encima del 25% no requeriría remediación[752], se basa en una lectura equivocada de la normativa del TULAS, que se enfoca en el porcentaje de arcilla encontrado en cada uno de los pozos de monitoreo como si estuvieran aislados mientras que la normativa de Ecuador busca proteger las aguas subterráneas en todas las

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748 *Ibid.*, párr. 27.

749 *Ibid.*, párr. 28.

750 *Ibid.*, párr. 29.

751 *Ibid.*, párr. 29.

752 Alegato de Clausura de Ecuador, pág. 29; Tr. (2) (McDonald) (12 de marzo de 2019), 402:16-19.

ubicaciones con aguas subterráneas potencialmente utilizables[753]. Tal como lo declarara el Sr. MacDonald, el contenido de arcilla puede variar significativamente en distancias cortas dentro de un mismo radio[754], y no resultaría lógico restaurar solamente las aguas subterráneas pertenecientes a ubicaciones con un contenido de arcilla menor a 25% puesto que dichas áreas se verían contaminadas nuevamente por contaminantes provenientes de las áreas adyacentes sin remediación[755].

659. Ecuador respalda asimismo el uso del Sr. MacDonald de un método de análisis de laboratorio respecto del cual Perenco alega que podría confundir sustancias naturales tales como hojas cerosas con TPH[756]. En primer lugar, el método de ensayo del Sr. MacDonald era el mismo que aquel que fuera utilizado por GSI (que no se ha quejado de la posibilidad de que la materia orgánica resinosa pudiera sesgar los resultados). En segundo lugar, la comparación de Perenco entre los cromatogramas de crudo y de elementos orgánicos en etapa de disolución no resulta apropiada. En tercer lugar, las explicaciones del Sr. MacDonald respecto de la detección de hidrocarburos petrolíferos en sus muestras de agua subterránea han sido consistentes y están respaldadas por elementos de prueba sustanciales[757].

660. Las críticas de Ecuador respecto de los resultados de aguas subterráneas del Sr. MacDonald son las siguientes: Ecuador señala que el Perito debía limitarse a "*confirm[ar] la presencia o ausencia de contaminación*" [Traducción del Tribunal]. El alcance de su trabajo no estaba designado para delinear la extensión total de la afectación de las aguas subterráneas en los sitios. Por lo tanto, en aras de determinar la "*potencial extensión de la contaminación de las aguas subterráneas*" [Traducción del Tribunal], el Sr. MacDonald utilizó una herramienta de análisis predictivo. El ejercicio realizado, sin embargo, no logra considerar el alcance real de los impactos en las aguas subterráneas[758]. En Payamino 13, por ejemplo,

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753 Tr. (2) (McDonald) (12 de marzo de 2019), 403:20-404:3.

754 *Ibid.*, 402:20-22.

755 *Ibid.*, 403:7-15. Véase Alegato de Clausura de Ecuador, pág. 29.

756 *Ibid.*, 404:11-14.

757 *Ibid.*, 404:11-405:12.

758 Comentarios de Ecuador sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 46.

mediante el uso de la Herramienta Predictiva de Aguas Subterráneas, el Sr. MacDonald estimó que la contaminación de aguas subterráneas detectada podría migrar solo 1,6m (y basó los costos de remediación en una dimensión de la pluma de 1,6m). No obstante, hay una fuente potencial de contaminación no identificable dentro de los 1,6m de los pozos de monitoreo afectados, lo cual confirma que la contaminación tuvo que migrar desde una distancia más lejana y que los costos de remediación calculados por el Sr. MacDonald son menores que los reales. En síntesis, la contaminación de las aguas subterráneas en realidad se extiende más allá del límite de la pluma que fuera estimado por el Sr. MacDonald[759].

(d) Costos unitarios

661. Ecuador considera que la cuantificación actual de los costos de remediación del Sr. MacDonald constituye el mínimo. Se esperaría que su estimación, que se encuentra en la etapa conceptual, sea menos precisa que aquella desarrollada en una etapa de diseño posterior en el marco de un plan de remediación. Con las lagunas de información que existen a la fecha, un factor de contingencia de entre el 10% y 30% no resulta suficiente[760].

662. Así pues, Ecuador defiende las estimaciones de costos unitarios del Sr. MacDonald y considera que son consistentes con los presupuestos locales[761]. Mientras que Perenco acusa al Sr. MacDonald de solo considerar la base de datos de RACER de los Estados Unidos y de haber afirmado que se basó en costos correspondientes a los Estados Unidos sobre la base de ese sistema, Ecuador señala que el Sr. MacDonald ha declarado repetidamente que analizó costos locales y que presentó evidencia de estos últimos[762]. RACER solo fue una prueba decisiva. Esto se confirma una vez que se convierte el presupuesto de Hidrogeocol para realizar una comparación directa con la estimación del Sr. MacDonald –son bastante similares[763].

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759 Alegato de Clausura de Ecuador, pág. 27.

760 Comentarios de Ecuador a la Sección 6.3 del Informe del Perito Independiente, párrs. 4 & 7.

761 *Ibid.*, 399:18-19.

762 *Ibid.*, 399:4-7.

763 *Ibid.*, 400:1-4.

663. Ecuador sostiene, además, que Perenco no puede alegar que los costos de unidad del Sr. MacDonald son muy altos sobre la base del presupuesto de Ecuambiente, del contrato de Petroamazonas con Icinerox de diciembre de 2018, o de lo que se declaró en la oferta de bonos de Petroamazonas en 2006. *En primer lugar,* el presupuesto de Ecuambiente es muy bajo. *En segundo lugar,* el contrato de Petroamazonas no es de remediación. *En tercer lugar,* la oferta de bonos no provee los detalles suficientes para arribar a conclusiones confiables sobre la base de esta última[764].

664. Perenco también criticó al Sr. MacDonald por no haber preparado un paquete de licitación para establecer los costos locales. Ecuador señala que GSI tampoco preparó un paquete de licitación y que ello no les impidió cuantificar los supuestos costos de remediación –esto fue admitido por el Sr. Bianchi durante la Audiencia Pericial [765].

665. Por último, Ecuador apoyó la tecnología de remediación propuesta por el Sr. MacDonald para las aguas subterráneas, lo que fuera criticado por Perenco, por ser una opción inapropiada en tales circunstancias[766].

2. Comentarios de Perenco sobre las Conclusiones de los Peritos Independientes

666. Perenco afirmó que las estimaciones de costos y de volumen del Sr. MacDonald eran exageradas. Además, argumentó que en el Informe Pericial el Sr. MacDonald no abordó cuestiones que el Tribunal le había indicado que analizara[767]. Para las cuestiones que sí abordó, se amparó en suposiciones injustificadas en lugar de hacerlo en datos históricos y científicos, sus análisis fueron errados y desestimó tanto las normativas ecuatorianas como las directivas del propio Tribunal[768].

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764 *Ibid.*, 487:19-492:16.

765 *Ibid.*, 399:12-17.

766 *Ibid.*, 405:21-406:4.

767 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 1.

768 *Id.*, párr. 1.

667. A pesar de las instrucciones del Tribunal, el Sr. MacDonald no ha investigado la causa de los excesos de límites, que podrían ser varias, o de qué forma atribuir la responsabilidad a Perenco o a cualquier otro colaborador. Por ende, el costo de remediación de USD 160 millones propuesto por el Sr. MacDonald no puede ser una cifra por la que le corresponda responsabilidad solamente a Perenco[769].

668. En sus escritos sobre el Informe del Perito Independiente del Tribunal, Perenco se centró en lo que identificó como nueve deficiencias significativas con consecuencias financieras materiales[770]. En sus escritos de cierre, Perenco agrupó estas cuestiones en las referentes a (1) volúmenes de suelo, (2) piscinas de lodo, (3) aguas subterráneas y (4) costos unitarios[771]. Para corregir esos errores, Perenco argumentó que el costo de remediación general es de no más de USD 65 millones, de los cuales posiblemente solo USD 25 millones pueden ser asignados a Perenco[772].

669. Perenco también señaló que, si bien el Sr. MacDonald "*realizó un trabajo en el que respetó las buenas prácticas en varios aspectos*" [Traducción del Tribunal], no tenía experiencia en la región de *Oriente* y no era especialista en llevar adelante tales proyectos en Ecuador[773].

(a) Suelos

(i) Clasificación del uso del suelo

670. Perenco cuestionó las clasificaciones de uso del suelo del Sr. MacDonald y afirmó que se basaban en "*inspección visual*"[774] lo cual resulta inadecuado.

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769 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 2.

770 *Ibid.*, párr. 3.

771 Véase Alegato de Clausura de Perenco, pág. 5.

772 El Tribunal expone los argumentos de las partes sobre causalidad y doble recuperación en la sección III.F *infra*.

773 Véase Diapositivas del Alegato de Clausura de Perenco pág. 6 que hace referencia a Tr (1) (MacDonald) (11 de marzo de 2019) 171:9-13.

774 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 25 y nota al pie 49 que hacen referencia al Informe del Perito Independiente, pág. 25. [Traducción del Tribunal]

671. *En primer lugar*, el enfoque del Sr. MacDonald es contrario a la instrucción del Tribunal de que las clasificaciones de uso del suelo "*deberían guiarse por las prácticas de las autoridades ecuatorianas en relación con los Bloques*" [Traducción del Tribunal] y que las decisiones previas tomadas por las autoridades ecuatorianas tienen "*importante valor probatorio*"[775].

672. Perenco afirmó que las autoridades ecuatorianas han aceptado en reiteradas ocasiones la aplicación de estándares "*agrícolas*" que no responden a un "*ecosistema sensible*" en áreas que rodean a las plataformas; IEMS lo reconoció. El TULAS además establece que las tierras agrícolas comprenden a aquellas "clasificadas como agrícolas", incluso si incluyen "flora nativa"[776]. A pesar de las afirmaciones del Sr. MacDonald en sentido contrario, las conclusiones de sus inspecciones visuales se contradecían con las de las autoridades ecuatorianas; dos ejemplos son Coca 6 y Mono CPF, en las que Ramboll utilizó la expresión "ecosistema sensible" a pesar de que los propios estudios de impacto ambiental de Ecuador reconocían que las áreas que rodean a las plataformas debían remediarse según estándares agrícolas pese a que estuvieran rodeadas de frondosos bosques secundarios[777].

673. *En segundo lugar*, Perenco aduce que las clasificaciones de uso del suelo del Sr. MacDonald revelan la falta de observaciones espaciales y temporales adecuadas. El Sr. MacDonald parece haber utilizado la directiva del Tribunal de aplicar una clasificación más estricta en cualquier caso de duda como excusa para ampararse en la observación superficial o insustancial, en lugar de realizar un estudio exhaustivo de la forma en la que los propietarios de las tierras y los residentes realmente utilizan la tierra con el paso del tiempo. Esto ignora el pleno alcance de las directivas del Tribunal sobre que las clasificaciones de uso del suelo "*deberían ser razonables en las circunstancias del caso en particular*"[778].

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775 *Ibid.*, párr. 26 y notas al pie 51-52. [Traducción del Tribunal]

776 *Ibid.*, párr. 26.

777 *Ibid.*, párr. 27.

778 *Ibid.*, párr. 29 y nota al pie 59. [Traducción del Tribunal]

674. Perenco señala tres ejemplos que fueron clasificados erróneamente como ecosistema sensible: Coca 10-16, donde un área al norte de la plataforma se encuentra dentro de un grupo de árboles y, de hecho, está rodeada de plantaciones agrícolas despejadas y un grupo de piscinas de Petroamazonas; Payamino 10 que, de hecho, se caracteriza por la evidente actividad agrícola, extensas franjas de áreas despejadas y un grupo de piscinas que al parecer incluye aproximadamente 20 piscinas; y Gacela 04, que es una gran vía de acceso al oleoducto de Petroamazonas (incluso Ramboll reconoce que "las áreas en funcionamiento que contienen otra infraestructura en uso" [Traducción del Tribunal] son tierras industriales y no un 'ecosistema sensible')[779].

675. *En tercer lugar*, el Sr. MacDonald, además, designó sitios "*inactivos*" como ecosistema sensible incorrectamente. Perenco argumentó que el hecho de que un pozo esté "inactivo" indica que podría reactivarse. El Tribunal sostuvo que la expresión ecosistema sensible no se aplica a un sitio que "se espera esté en funcionamiento durante muchos años. . . [y] todavía distante de cualquier uso 'posterior'"[780]. Sin embargo, eso fue lo que Ramboll hizo, por ejemplo, en Lobo 4 y Jaguar 7-8, a los cuales denominó ecosistema sensible simplemente porque las plataformas en la actualidad se encuentran "inactivas"[781].

(ii) Cálculos de fondo

676. Perenco argumentó que el Sr. MacDonald, de forma incorrecta, excluyó todas las muestras de suelos limpios de GSI para determinar las concentraciones de fondo y se basó en muestras equivalentes de IEMS[782].

677. *En primer lugar*, el hecho de que el Sr. MacDonald excluyera las muestras de fondo de GSI debido a que "muchas" se "recolectaron en la *proximidad inmediata* a ciertas plataformas y cerca de áreas en las que se investigan los impactos relacionados con

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779 *Ibid.*, párr. 32 y nota al pie 62 que hacen referencia al Informe del Perito Independiente, pág. 38.

780 *Ibid.*, párr. 34 y nota al pie 65 que hacen referencia a la Decisión Provisional, párr. 490 y Anotaciones de Perenco sobre las Secciones 3.1 y 6.2 del Informe del Perito Independiente. [Traducción del Tribunal]

781 *Ibid.*, párr. 34 y nota al pie 66.

782 *Ibid.*, párr. 23.

yacimientos petrolíferos" [Traducción del Tribunal] contradice de forma directa el TULAS, que especifica que las muestras deben tomarse en aquellas áreas exteriores lindantes con el área que se esté estudiando[783]. La proximidad debería haber sido una característica que calificara a las muestras de fondo de GSI y no que las descalificara. Incluso si la proximidad no fuera una preocupación, esto no podría justificar la exclusión general del total de 91 muestras de GSI; el Sr. MacDonald además debería haber aplicado el mismo límite a las muestras de IEMS, algunas de las cuales correspondían a áreas más cercanas que las muestras de GSI[784]. En cualquier caso, en los seis sitios en los que tanto IEMS como GSI realizaron muestreos de fondo, el 50% de las muestras de IEMS corresponden a áreas más cercanas a las plataformas que las muestras de GSI, no es posible que todas las muestras de fondo de IEMS fueran uniformemente válidas mientras que las de GSI no lo fueran[785].

678. *En segundo lugar*, el hecho de que Ramboll adoptara los datos de fondo de cromo obtenidos a partir de las muestras de GSI prueba que las muestras, de hecho, no correspondían a áreas "muy cercanas" a las plataformas. De haber correspondido a áreas "muy cercanas", tampoco se podrían haber obtenido datos de cromo válidos[786].

679. *En tercer lugar*, la exclusión de los datos de fondo de GSI por parte de Ramboll debido a que GSI "*excluyó una cantidad de concentraciones de muestra identificadas como valores atípicos altos de sus conjuntos de datos*" [Traducción del Tribunal] tampoco tiene sentido. La exclusión por parte de GSI de lo que consideró como muestras de valores atípicos altos hizo que sus concentraciones de fondo fueran más conservadoras. Aun si Ramboll consideraba este enfoque inadecuado, la respuesta adecuada era incluir las muestras de valores atípicos, no excluir todas las muestras que no fueran valores atípicos. De hecho, el propio Ramboll incluyó las muestras de valores atípicos para realizar su ensayo estadístico y además hizo exactamente este tipo de "corrección" a los datos de IEMS, que están

783 *Ibid.*, párr. 36 y nota al pie 69.
784 *Ibid.*, párr. 37.
785 *Ibid.*, párr. 39.
786 *Ibid.*, párr. 40.

corregidos para justificar "errores de recopilación/tipográficos" [Traducción del Tribunal] y resultados no detectados[787].

680. *En cuarto lugar*, que Ramboll ignorara las muestras de fondo de GSI creyendo que provienen de una "población" estadística distinta que la de las muestras de fondo de IEMS constituye un error en la aplicación de una herramienta estadística[788]. Perenco aduce que lo que los datos reflejan es simplemente el hecho de que el Bloque 7, que comprende más de 200.000 hectáreas y distintas zonas geológicas, en realidad tiene muchas subpoblaciones presentes incluso en las propias muestras de IEMS[789]. El Sr. MacDonald no debería haber ignorado las muestras de GSI, incluso reconoció que es mejor contar con más cantidad de muestras de fondo[790].

(iii)Delineación

681. Perenco afirmó que las delineaciones realizadas por el Sr. MacDonald omitían la topografía, los equipos activos y las características de los sitios, así como también sus propias muestras limpias de suelo. Por ende, no coincidían con la realidad de los sitios y, como resultado, sobreestimaban la contaminación[791].

682. *En primer lugar*, el enfoque de delineación "macro" del Sr. MacDonald ignoraba tanto la topografía como los equipos activos y las características de los sitios. Por ejemplo, la delineación realizada por Ramboll en Coca 6 incluía un cerro que bordeaba el alcantarillado y asumía que la contaminación al oeste del cerro podría, de alguna forma, haberse extendido hasta la parte superior de la pendiente y por encima de la cima del cerro[792]. En

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787 *Ibid.*, párr. 41.

788 *Ibid.*, párr. 42.

789 *Ibid.*, párr. 45.

790 Véase Diapositivas del Alegato de Cierre de Perenco, pág. 15.

791 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 47.

792 *Ibid.*, párr. 48.

Mono CPF, también se muestra *infra*, el área de remediación definida por Ramboll incluía instalaciones de producción con sistema de antorcha y separador API[793].

683. *En segundo lugar*, la delineación realizada por el Sr. MacDonald incluía la remediación de áreas en las que las muestras de Ramboll no mostraban excesos de límites o en las que Ramboll ni siquiera tomó muestras. Un ejemplo es Coca 02/CPF, en donde el área delineada no incluía ningún exceso de límites detectado e incluye una vía de acceso al oleoducto de Petroamazonas que se construyó luego de las campañas de muestreo de GSI y de IEMS[794]. Perenco además señaló que la delineación del Sr. MacDonald exigiría la remediación de la grava, que no es suelo (por ejemplo, en Jaguar 03), remediación de celdas de eliminación de residuos (por ejemplo, Relleno Sanitario de Payamil) o remediación de áreas sin excesos de límites de TPH (por ejemplo, Yuralpa CPF)[795].

(b) Piscinas de lodo

684. En relación con las piscinas de lodo, Perenco argumentó que Ramboll omitió pruebas tanto históricas como visuales de revestimientos sintéticos y, por ende, aplicó estándares regulatorios erróneos (por ejemplo, los requisitos más estrictos con respecto a los excesos de límites para las piscinas de lodo sin revestimiento) y extralimitó el mandato del Tribunal y el derecho al debido proceso de las Partes al tomar muestras en piscinas en las que las Partes no habían tomado muestras[796].

685. Perenco criticó al Sr. MacDonald por asumir "sin excepción" que las piscinas de Perenco no estaban revestidas, lo cual se opone a la instrucción del Tribunal de investigar si estas piscinas se encontraban cerradas con revestimientos impermeables y de "determinar si los lodos de perforación se desechaban en una piscina sellada construida de forma adecuada"[797].

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793 *Id.*

794 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 49.

795 *Ibid.*, párr. 50; Anotaciones de Perenco sobre la Sección 6.2 del Informe del Perito Independiente.

796 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 23.

797 *Ibid.*, párr. 52. [Traducción del Tribunal]

686. *En primer lugar*, a pesar de que el Sr. MacDonald alegó que perforar a través del fondo de las piscinas de lodo para confirmar la presencia de revestimientos habría comprometido las unidades de haber uno; el Sr. MacDonald podría haber excavado manualmente una parte superficial alrededor del borde de la piscina y determinar la presencia o ausencia de un revestimiento impermeable en la parte interior de la ladera de la excavación[798].

687. *En segundo lugar*, aun cuando Ramboll identificó pruebas visuales de revestimientos en los perímetros de ciertas piscinas de lodo, las ignoró porque "*no tenía información respecto del estado o de la extensión que podrían tener*" y porque las "[f]otografías tomadas por Perenco al momento de cierre de algunas piscinas de lodo muestran que comúnmente se utilizaba una perforadora para tratar el material de las piscinas de lodo en el lugar, lo cual probablemente habría tenido como consecuencia que cualquier material de revestimiento se rompiera"[799]. Sin embargo, en lugar de tratar el material de las piscinas de lodo en el lugar, el expediente muestra que Perenco, frecuentemente, mezclaba lodo en piscinas auxiliares antes de transferir los lodos a las piscinas de desechos reales, y que las perforadoras simplemente se utilizaban para ubicar los materiales de las piscinas de lodo dentro de las piscinas. Esta práctica, *probablemente*, no habría tenido como resultado que cualquier material de revestimiento se rompiera. Ramboll no examina ninguna de estas pruebas[800].

688. *En tercer lugar*, Ramboll debería haber tenido en cuenta las pruebas del expediente que muestran que varias piscinas de Perenco cuentan con revestimientos sintéticos impermeables. En contraposición a la declaración de Ramboll acerca de que no se "proporcionó ninguna prueba directa sobre si había revestimientos en cualquiera de las piscinas de lodo en particular" [Traducción del Tribunal], Perenco había presentado informes sobre el cierre de las piscinas, fotografías y declaraciones en las que se demostraba que las piscinas de lodo estaban revestidas con revestimientos

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798 *Ibid.*, párr. 53.

799 *Ibid.*, párr. 54 y notas al pie 105-106, que hace referencia al Informe del Perito Independiente, pág. 73 y pág. 65, notal al pie 142. [Traducción del Tribunal]

800 *Ibid.*, párr. 54.

impermeables[801]. Perenco señala los ejemplos de Oso 9, Coca 19 y Jaguar 9. Por consiguiente, en varias piscinas se cumplía con los estándares regulatorios y no sería necesaria la remediación.

689. Perenco además criticó al Sr. MacDonald por investigar algunas piscinas que no se encontraban dentro del mandato y por asumir que otras piscinas presentaban excesos de límites sin haberles tomado muestras[802].

690. *En primer lugar*, el Tribunal le indicó al Sr. MacDonald que tomara muestras de sitios en los que excesos de límites regulatorios habían sido identificados ya sea por los peritos de una de las Partes o de ambas. No obstante, el Sr. MacDonald tomo muestras de tres piscinas en Oso 9B a pesar de que ni GSI ni IEMS fueron a este sitio. Además, tomó muestras de cuatro piscinas en Oso 9A, a pesar de que en la única muestra de suelo, que había sido tomada por IEMS, no se observaban excesos de límites. El Sr. MacDonald además tomó muestras de la Piscina de Relleno Sanitario Yuralpa 2 y de la Piscina Yuralpa G 2, a pesar de que GSI e IEMS no detectaron excesos de límites en estos sitios y no recolectaron ninguna muestra de esas piscinas. Perenco aduce que Ramboll extralimitó su mandato, ya que había investigado Oso 9A, Oso 9B, Oso 9 Piscinas 2 y 4, la Piscina de Relleno Sanitario Yuralpa y la Piscina Yuralpa G 2, que no eran áreas que IEMS o GSI hubieran estudiado previamente o de las que hubieran tomado muestras[803]. Esto se oponía a la directiva de la Decisión Provisional sobre la Reconvención y al mandato identificado por el Sr. MacDonald en su informe[804]. No se trataba de áreas que hubieran sido investigadas o de las que IEMS o GSI hubieran tomado muestras previamente[805].

691. *En segundo lugar*, en contraposición a la instrucción del Tribunal, el Sr. MacDonald asumió que los excesos de límites existían en dos piscinas de lodo en Oso 9 solamente en

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801 *Ibid.*, párr. 55.

802 *Ibid.*, párr. 56.

803 Véase Diapositivas del Alegato de Clausura de Perenco, pág. 21.

804 Alegato de Clausura de Perenco, pág. 21, que hace referencia a la Decisión Provisional, párr. 603 y al Informe del Perito Independiente, pág. 49.

805 Véase Diapositivas del Alegato de Clausura de Perenco, pág. 21.

función de que las piscinas adyacentes no cumplían con el estándar de degradación establecido para piscinas revestidas, sin haber tomado ninguna muestra de aquellas piscinas y a pesar de reconocer que las piscinas 2 y 4 "no fueron investigadas por ninguna de las Partes ni por Ramboll"[806]. Las muestras de Ramboll demuestran que este supuesto no es correcto, ya que en ellas se observa que la Piscina 8 en Oso 9 cumplía con el estándar, a pesar de que no ocurría lo mismo con la Piscina 9 adyacente. En consecuencia, estas nueve piscinas en Oso y dos de Yuralpa deberían excluirse ya que no están comprendidas dentro del mandato del Tribunal y no existen pruebas de excesos de límites[807].

692. *Además*, Perenco argumentó que, en función de los informes de cierre de piscinas y otros documentos contemporáneos, había presencia de revestimientos en piscinas que fueron cerradas de forma adecuada en 18 de las piscinas de lodo de cinco sitios[808]. Esto implica que Perenco cumplió con los estándares del RAOHE al momento de cierre. Perenco, además, ha probado que las piscinas de lodo, o al menos algún segmento de ellas, tenían revestimientos intactos al momento de la instalación y no existen pruebas legítimas específicas de que exista algún problema con dichos revestimientos[809]. Perenco además alegó que las notas de campo de IEMS o bien registraban referencias a las piscinas de Coca 4 y Payamino en concreto, las cuales no fueron construidas por Perenco; o bien registraban a empleados que decían que las piscinas estaban revestidas y que no tenían razón para creer que existiera ningún problema con ellas o que tuvieran pérdidas[810]. En relación con el uso de perforadoras, Perenco argumentó que es una práctica común, que hasta Petroamazonas lleva a cabo.

693. *En tercer lugar*, Perenco alegó que la remediación de la piscina de lodo del Sr. MacDonald también presentaba las siguientes deficiencias técnicas: la remediación de la piscina de lodo

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806 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 59. [Traducción del Tribunal]

807 *Ibid.*, párr. 59.

808 Tr (2) (MacDonald) (12 de marzo de 2019) 427:1-5, que hace referencia a las Diapositivas de la Presentación de Cierre de Perenco, pág. 16.

809 *Ibid.*, 427:15-20.

810 *Ibid.*, 429:8-13.

1 en Yuralpa Pad A de Ramboll, en la que ignoró el estándar de rendimiento exigido por el RAOHE; de conformidad con el estándar correcto no necesitaría remediación (Perenco argumentó que el estándar de la Tabla 7b era aplicable)[811]; que Ramboll ignorara las instrucciones del RAOHE de realizar pruebas de degradación para 6 HAP (y, en su lugar, las realizó para 16 HAP)[812]; la conclusión de Ramboll sobre que la cubierta de suelo limpia de las piscinas necesita remediación, a pesar de que no presenta excesos de límites[813]; y, por último, debido a que Ramboll no tenía las "dimensiones específicas de las piscinas de lodo" para las piscinas específicas de las que tomó muestras en Oso 9A y 9B, determinó la remediación dos grupos completos de piscinas conformados por varias piscinas de las que Ramboll ni siquiera había tomado muestras[814].

(c) Aguas subterráneas

694. Con respecto a las aguas subterráneas, Perenco aduce que el Sr. MacDonald ignoró el criterio expreso del TULAS sobre el contenido de arcilla para las muestras de aguas subterráneas y no reconoció que en sus propios datos de laboratorio se observa que los presuntos excesos de límites respecto de TPH se debían a materia orgánica natural y no a crudo.

695. *En primer lugar*, Perenco argumenta que Ramboll ignora los estándares sobre el contenido de arcilla establecidos en el TULAS y que dicha legislación no es aplicable cuando el contenido de arcilla supera el 25%. El Libro VI, Anexo 1, Tabla 5 del TULAS establece que los "[c]riterios referenciales de calidad para aguas subterráneas" son aplicables para "suelo[s] con contenido de arcilla entre (0-25,0) %". El TULAS, por lo tanto, no establece un criterio específico para acuíferos con contenidos más altos de arcilla o materia orgánica,

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811 Véase Anotaciones de Perenco sobre la Sección 6.2 del Informe del Perito Independiente, págs. 196-197 del Informe Pericial Consolidado.

812 Véase Anotaciones de Perenco sobre la Sección 6.2 del Informe del Perito Independiente, pág. 195 del Informe Pericial Consolidado.

813 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 60 y nota al pie 123; véase además Anotaciones de Perenco sobre la Sección 5.2 del Informe del Perito Independiente, pág. 94 del Informe Pericial Consolidado.

814 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, Párr. 58.

esto significa que no es necesario que los suelos con contenido de arcilla mayor a 25% (y contenido de materia orgánica menor al 10%) cumplan con el criterio establecido en la Tabla 5 del TULAS y, por consiguiente, que los excesos de límites respecto de esos criterios no son nocivos para el medio ambiente si el contenido de arcilla del suelo es mayor a 25%. Esto no fue impugnado por IEMS[815].

696. Sobre el particular, Perenco, además, invoca la explicación proporcionada por el Sr. Bianchi en la Audiencia Pericial acerca de que en Ecuador los estándares relativos al contenido de arcilla se aplican de forma directa[816]. La desaprobación por parte del Sr. MacDonald de la línea normativa establecida en la Tabla 5 no constituye un fundamento válido para que el Tribunal la deniegue y, según aduce Perenco, la decisión de los reguladores ecuatorianos de exigir un bajo contenido de bario en aguas con contenido de arcilla menor al 25% resulta racional porque las personas no beben agua que tenga montones de arcilla o materia orgánica flotando[817]. Este compromiso forma parte del enfoque ambiental y de desarrollo equilibrados que Ecuador quiere aplicar. En cualquier caso, el primer informe de IEMS y otras pruebas muestran que las aguas subterráneas no son realmente la fuente de agua potable en esta área, lo cual puede ser otra razón de por qué esta norma tenía sentido en la forma en la que se la expresó[818].

697. Luego de excluir las muestras de aguas subterráneas con contenido de arcilla superior al 25%, varios de los pozos de monitoreo de Ramboll no presentan excesos de límites.

698. *En segundo lugar*, Perenco señala que los resultados del Sr. MacDonald sobre aguas subterráneas arrojaron "aciertos" casi omnipresentes de la TPH (incluso en áreas en las que no se identificaron excesos de límites respecto de TPH en los suelos que las rodean e incluso en áreas en las que IEMS y GSI jamás encontraron TPH en los muestreos de aguas subterráneas que realizaron. Tal como el Sr. MacDonald aparentemente reconoció, estos

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815 *Ibid.*, párr. 62 y nota al pie 128.

816 Véase Alegato de Clausura de Perenco pág. 24 que hace referencia a Tr. (1) (11 de marzo de 2019) (MacDonald) 268:17-269:12.

817 Tr. (2) (MacDonald) (12 de marzo de 2019) 434:1-15.

818 *Ibid.*, 434:16-20.

inexplicables excesos de límites de TPH son inusuales y deberían haber sido considerados como una señal de alerta. De hecho, el tipo de prueba que el laboratorio de Ramboll realizó utiliza un método que no es específico para petróleo crudo y puede identificar de forma incorrecta sustancias naturales del tipo de las de hojas cerosas como TPH. Resulta especialmente problemático que Ramboll no haya investigado esta diferencia, dado que las hojas cerosas son comunes en la selva ecuatoriana. Si Ramboll hubiera analizado los cromatogramas de sus muestras para determinar si realmente se trataba del impacto relacionado con yacimientos petrolíferos o de un fenómeno natural, habría observado que la mayoría de ellas no corresponden, de ninguna manera, a crudo[819].

699. Perenco, además, cuestiona la herramienta de modelado para aguas subterráneas del Sr. MacDonald[820]. En el terreno pantanoso y en los suelos, generalmente, poco permeables de los Bloques 7 y 21, las aguas subterráneas se mueven muy lentamente y no es posible que trasladen contaminantes a lo largo de distancias significativas, incluso en largos períodos de tiempo. Debido a su diseño, la herramienta de modelado que utilizó Ramboll y el análisis de sensibilidad realizado deberían proporcionar una sobrevaloración conservadora de las verdaderas dimensiones de la estela. No obstante, el costo de remediación para aguas subterráneas, sorprendentemente alto, de Ramboll alcanzó los $ USD 25 millones. La incongruencia de este resultado debería, nuevamente, haber promovido que se realizaran análisis adicionales de los resultados de Ramboll. Perenco señala tres cuestiones respecto del modelado de aguas subterráneas del Sr. MacDonald: (i) utilizó la versión tridimensional del software de modelado, en lugar de la bidimensional, que hubiera previsto estelas mucho menores en cada sitio; (ii) su modelo no toma en cuenta la biodegradación de la contaminación a lo largo del tiempo y, por ende, sobreestima el tamaño de la estela en aguas subterráneas; (iii) en varias de las estelas informadas por Ramboll, no se pudo identificar el origen, lo cual es coincidente con otros factores que sugieren que no hay

819 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 64.

820 Anotaciones de Perenco sobre la Sección 6.1 del Informe del Perito Independiente, pág. 145 del Informe Pericial Consolidado.

presencia de dichas estelas y que, de hecho, en algunos casos, son artificio de los resultados de TPH incorrectos.

(d) Costos Unitarios

700. Perenco afirma que los costos de remediación de Ramboll no reflejan los costos locales. Ramboll no consideró los costos reales incurridos por la propia Petroamazonas por trabajo de remediación similar, a pesar de que el Tribunal había determinado que dichos costos constituyen "la mejor guía para la estimación de trabajos de remediación similares"[821]. Los costos de Ramboll son elevados. Ramboll no cumplió con las instrucciones provistas por el Tribunal en la Decisión Provisional sobre la Reconvención respecto de que la cuantificación debe realizarse en función de los costos ecuatorianos reales[822]. Perenco, además, reclama que Ramboll jamás proporcionó a las Partes una copia de su cotización de aguas subterráneas y suelos para que la verificaran[823].

701. Además, para el suelo puntualmente, los costos unitarios de Ramboll no presentan relación alguna con los costos reales en Ecuador, como se demuestra tanto en las dos cotizaciones que Ramboll obtuvo tardíamente como en los propios documentos publicados por Petroamazonas. En su lugar, Ramboll generó las cifras de remediación mediante RACER, que produce estimaciones en función de los costos de remediación en los Estados Unidos[824]. Esto claramente se contradice con los costos de Petroamazonas establecidos en un contrato real, que se calcularon utilizando un método adecuado.

702. *En primer lugar*, Ramboll no analizó las pruebas sobre costos locales que constaban en el expediente del presente procedimiento y tampoco explicó los fundamentos de por qué las rechazó. Como GSI había explicado, varios proyectos de remediación han sido completados en instalaciones de yacimientos petrolíferos en la región de *Oriente* de

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821 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 12 de febrero de 2019, párr. 65 y nota al pie 137. [Traducción del Tribunal]

822 Alegato de Clausura de Perenco, pág. 44, que hace referencia a la Decisión Provisional, párr. 579 y nota al pie 1156.

823 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 12 de febrero de 2019, párr. 66.

824 Alegato de Clausura de Perenco, pág. 48, que hace referencia a la declaración testimonial del Sr. MacDonald de Tr. (1) (MacDonald) (11 de marzo de 2019) 87:21-88:5.

conformidad con lo dispuesto por el RAOHE o el TULAS y han estado sujetos a la revisión y aprobación de las autoridades ecuatorianas, incluso proyectos de Petroecuador y otros operadores de yacimientos petrolíferos. A un valor de USD 410/m.^{3}, la tarifa unitaria bruta para la remediación de suelo de Ramboll supera sustancialmente a la de todos estos proyectos de remediación aprobados por el Gobierno. Si bien el Tribunal reconoció que la estimación conservadora del costo grueso para la remediación del suelo de GSI a un valor de USD 260/m³ era "mucho más cercana" que la de IEMS a los costos reales de remediación en Ecuador, la cifra de Ramboll asciende a más del doble, lo cual resulta incomprensible.

703. *En segundo lugar*, Ramboll ha omitido los costos reales de remediación incurridos por Petroamazonas, fácilmente disponibles en documentos públicos. En diciembre del año 2018, Petroamazonas suscribió un contrato de trabajos de remediación en los Bloques 7 y 21, entre otros, que incluye costos unitarios sustancialmente más bajos para la remediación del suelo: por ejemplo, USD 39/m³ para el tratamiento y la eliminación de suelo con presencia de TPH y metales, en comparación con USD 160/m³ de Ramboll. Asimismo, en el mes de diciembre del año 2017, Petroamazonas publicó una oferta de obligaciones, según la cual "en 2016, Petroamazonas incurrió en gastos de, aproximadamente, USD 23.1 millones para la implementación del Proyecto Amazonía Viva", que incluía la remediación de "aproximadamente 364.240 metros cúbicos de suelo [...] y de 191 fuentes de contaminación" en ciertos bloques fuera de los Bloques 7 y 21. Estas cifras implican un costo unitario grueso de alrededor de USD 63/m³, mientras que el costo unitario grueso de Ramboll de USD 410/m^3 es seis veces más alto. La magnitud de estas divergencias entre los costos reales, recientes y documentados del trabajo en los Bloques y en áreas aledañas, por un lado, y la estimación de tipo caja negra producida mediante un software en función de la remediación en los Estados Unidos, por el otro, indican la poca fiabilidad del enfoque general de Ramboll y la precaución con la que el Tribunal debería abordarlo[825].

704. *En tercer lugar*, las cotizaciones de dos contratistas, Hidrogeocol Ecuador y Ecuambiente, obtenidas por Ramboll, tampoco son una guía fiable. Aparentemente, Ramboll recibió las

825 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 69.

cotizaciones entre fines de noviembre y diciembre del año 2018 —un año completo después de haber finalizado la segunda campaña de muestreo en Ecuador, y apenas tres semanas antes de que el Sr. MacDonald presentara el Informe a las Partes. El costo unitario de transporte y tratamiento de suelo contaminado con TPH y metales pesados de Hidrogeocol asciende a USD 260/m³, es seis veces más alto que el costo unitario real de Petroamazonas de USD 39/m³ por trabajo similar de remediación. Asimismo, el costo unitario de transporte y tratamiento de suelos con presencia de TPH solamente de Ecuambiente es de USD 56/m³, mientras que el costo unitario real de Petroamazonas es de USD 46/m³ por trabajo similar de remediación. Ramboll no pareciera haber obtenido variedad de cotizaciones de otros contratistas o haber tenido en cuenta el hecho de que las cotizaciones proporcionadas inicialmente a sociedades extranjeras —especialmente en el contexto de un litigio— son típicamente más altas[826].

705. *Por último*, a pesar de haber obtenido estas cotizaciones infladas, sin lugar a duda debido a que las recibió muy tarde, Ramboll ni siquiera las aplicó cuando calculó sus costos de remediación. En cambio, Ramboll aumentó ciertos tipos de costos unitarios sin razón aparente más allá de su "*experiencia profesional*", sobre la cual no proporciona explicación alguna. En un contexto en el que el Tribunal ha sostenido que "*el perito deberá guiarse por los costos ecuatorianos*", ese enfoque no es aceptable[827].

706. Los costos unitarios de remediación de Ramboll, por consiguiente, no establecen los costos locales reales sobre los cuales debe fundamentarse la remediación, como determinó el Tribunal. En cambio, el Tribunal debería aplicar los costos reales en los que incurrió recientemente Petroamazonas, que constituyen la "mejor guía para la estimación de trabajos de remediación similares". Al ajustar la estimación de costos unitarios de Ramboll para que refleje los costos reales de suelo de Petroamazonas, los costos unitarios de suelo de Ramboll se reducen a la mitad. Por consiguiente, el costo de remediación de suelo de Ramboll se reduce de USD 98 millones a USD 50 millones simplemente al utilizar costos

826 *Ibid.*, párr. 70.

827 *Ibid.*, párr. 71.

locales, y a USD 40 millones, aproximadamente, luego de todas las correcciones técnicas (antes de la asignación)[828].

F. Causalidad y Doble Recuperación

707. Aun si las instrucciones recibidas por el Sr. MacDonald no incluían que investigara la causalidad, además de los comentarios y escritos en relación con los estudios y conclusiones del Sr. MacDonald, las Partes abordaron esta cuestión así como también la cuestión de doble recuperación a la luz de la decisión del tribunal de *Burlington* sobre la reconvención ambiental de Ecuador. Los argumentos de las Partes se exponen *infra*.

1. Argumentos de Ecuador

708. Ecuador aduce que la Decisión Provisional sobre la Reconvención del Tribunal es clara en cuanto a que la carga de la prueba corresponde a Perenco[829]. Por ende, si existe un exceso de límites regulatorio, Perenco es responsable de dicho exceso a menos que pueda probar que el daño causado se debe a alguna otra persona o un evento externo. Perenco no ha cumplido con esta carga de la prueba y, por consiguiente, debería ser responsable, al menos, por la contaminación confirmada por el Sr. MacDonald en los Bloques 7 y 21[830].

709. *En primer lugar*, en cuanto a la supuesta contaminación provocada por los operadores *antes* de comenzar las operaciones en los Bloques 7 y 21, Perenco no probó que la vasta contaminación confirmada por el Sr. MacDonald ya existía en los Bloques cuando comenzó con las operaciones en el año 2002[831].

710. Perenco no señaló pruebas documentales que confirmaran esta teoría acerca de que la contaminación habría sido provocada por operadores previos: (i) Perenco no realizó un estudio integral escrito de la condición ambiental de los Bloques al momento de la

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828 *Ibid.*, párr. 72.

829 Alegato de Clausura de Ecuador, Diapositiva 5.

830 Comentarios de Ecuador sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, Sección 3.

831 *Ibid.*, párr. 50.

adquisición; (ii) ni el Acuerdo de Servicios Profesionales (PSA, por sus siglas en inglés) celebrado entre Perenco y Kerr-McGee ni la Auditoría Bienal del año 2002 de Perenco sugerían problemas ambientales graves en ese momento; e (iii) incluso las auditorías bienales de 2006 y 2008, insustanciales y altamente selectivas, mostraban un considerable deterioro en las condiciones ambientales de los Bloques[832].

711. Perenco no puede atribuir la contaminación a operadores previos (los cuales estaban limitados solo a 23 sitios). Las respuestas de Ecuador a las alegaciones de Perenco respecto de cinco de estos sitios son las siguientes: (i) las pruebas que constan en el expediente muestran que la contaminación en Payamino 2-8 se remonta al momento de las operaciones de Perenco; (ii) el exceso de límites en el área pantanosa al sudeste de Coca CPF estaba asociada a la descarga de agua producida con residuos de crudo del separador API durante las operaciones de Perenco, como confirmó el Sr. MacDonald y reconoció el Sr. Salto ante el tribunal de *Burlington*; (iii) el derrame de 1999 en Coca 6 migró al sudoeste de la plataforma, mientras que el área que identificó el Sr. MacDonald para remediación se ubica al sudeste de la plataforma; (iv) el tribunal de *Burlington* declaró a Perenco responsable de la remediación de la piscina de Coca 8; y (v) GSI inspeccionó la piscina de Payamino 4 y atestiguó que no tenía pérdidas, por ende, ninguna contaminación podría relacionarse con esta piscina[833].

712. Con respecto a la negación de responsabilidad por parte de Perenco en relación con 19 sitios fundada en un "argumento simplista" acerca de que los excesos de límites en estos sitios, en su mayoría, tenían que ver con metales pesados y áreas de piscinas y, en consecuencia, fueron provocadas por perforaciones realizadas previamente a los derechos de operación, Ecuador argumenta que esta suposición carece de sustento[834]. Por ejemplo, Perenco aduce que los excesos de límites respecto de bario solo pueden surgir de las actividades de perforación iniciales. Sin embargo, Perenco realizó varias reparaciones y declaró el transporte de lodos de perforación de un sitio a otro para su almacenamiento,

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832 *Ibid.*, párrs. 50-53.

833 *Ibid.*, párr. 55.

834 *Ibid.*, párr. 56.

ambas actividades posiblemente hayan provocado los excesos de límites encontrados[835]. En Yuralpa A, Perenco además realizó perforaciones en el período comprendido entre los años 2003 y 2006 y debería saber si sus perforaciones causaron contaminación en este sitio[836]. Además, se produjeron varios derrames de petróleo que no se informaron durante las operaciones de Perenco y sobre los que no existen pruebas de una remediación adecuada[837]. Perenco ahora acepta que, al menos, parte de la contaminación en Jaguar 1 la causó un derrame durante el período en el que estuvo en operación que no se informó, y que perforó en Coca 19 en el año 2003, lugar en el cual el Sr. MacDonald confirmó la contaminación del suelo y que piscinas asociadas a Perenco no cumplían con las normas[838].

713. Además, si Perenco realmente quería identificar la causa de los excesos de límites respecto de TPH encontrados y el momento en el que se produjeron, podría haber realizado (ya que tuvo muchas oportunidades de hacerlo antes y después de julio 2009) un análisis de determinación de la huella de hidrocarburos o haber aplicado alguna otra técnica forense de laboratorio. Las pruebas, al menos, mostrarían si una emisión en particular era reciente o muy antigua y, de esa forma, se podría determinar si se produjo antes o después de las operaciones de Perenco[839].

714. Además, Perenco heredó toda la responsabilidad ambiental sobre cualquier condición preexistente presente en los Bloques[840].

715. Ecuador, además, argumenta que se halló que las piscinas asociadas a Perenco no cumplían con las normas en todos los sitios investigados por el Sr. MacDonald[841]. Esta conclusión no resulta sorprendente y confirma que las prácticas deficientes de Perenco se extienden a la ubicación, construcción, utilización y administración de las piscinas. Por ende, no existen

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835 *Id.*, párr. 56.

836 *Id.*, párr. 56.

837 *Ibid.*, párr. 57.

838 *Ibid.*, párr. 58.

839 *Ibid.*, párr. 60.

840 Alegato de Clausura de Ecuador, Diapositiva 10.

841 Comentarios de Ecuador sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 61.

dudas acerca de que estos excesos de límites son atribuibles a Perenco. Ecuador, además, aduce que Perenco es responsable, al menos, de la remediación íntegra de todas las piscinas de lodo investigadas por el Sr. MacDonald dado que: (i) recae sobre Perenco la carga de la prueba en relación con la colocación de piscinas adecuadas ya que debería tener tales registros, pero no ha cumplido con dicha carga[842]; y (ii) existían muchas más piscinas de lodo que el Sr. MacDonald debería haber investigado, pero no investigó[843].

716. *En segundo lugar*, con respecto a la supuesta contaminación causada por Petroamazonas (en adelante, "PAM") luego de que comenzara a operar en los Bloques 7 y 21, Perenco no puede probar que toda contaminación identificada por el Sr. MacDonald sea atribuible a Petroamazonas. Perenco se ha referido a un solo incidente en Mono CPF en el año 2011 que, presuntamente, podría ser el origen de la contaminación en una de las áreas de ese sitio. Sin embargo, los contenidos limitados de ese derrame producido en el año 2011 se trasladan al extremo opuesto de la plataforma debido a la pendiente del terreno (es decir, al noreste y no al sudeste de la plataforma, donde se ubica el área contaminada que identificó el Sr. MacDonald), pero además resulta cronológicamente imposible que la contaminación delineada por el Perito sea el resultado de un derrame de PAM producido en el año 2011, dado que, ya durante el primer trabajo de campo en el mes de octubre del año 2010, IEMS había tomado muestras en las que se observaban excesos de límites respecto de TPH en la misma área identificada por el Sr. MacDonald[844]. Aparte de este incidente aislado, la otra única reclamación de Perenco consiste en que los nuevos trabajos de Petroamazonas cubrieron otros 9 sitios[845].

717. En cualquier caso, las pruebas obrantes en el expediente, incluso los documentos divulgados recientemente por Ecuador, confirman que Petroamazonas no provocó la contaminación ni contribuyó a ella. *En primer lugar*, 11 de los sitios y todas las piscinas identificadas para la remediación no han sido operadas ni utilizadas por Petroamazonas[846].

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842 Alegato de Clausura de Ecuador, Diapositiva 18.

843 *Ibid.*, Diapositiva 19.

844 Comentarios de Ecuador sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 64.

845 *Ibid.*, párr. 63.

846 *Ibid.*, párrs. 66 y 68.

En segundo lugar, como el Sr. MacDonald realizó un ejercicio de resolución de carencias, la contaminación que identificó es la misma identificada por IEMS (y otros, como Walsh y GSI) desde 2010. *En tercer lugar*, ninguno de aquellos que realizaron inspecciones desde el año 2010 hasta el año 2017 observó incidentes ambientales luego del mes de julio de 2009 y el informe del Sr. MacDonald no menciona que se haya observado ninguna señal de contaminación reciente durante los estudios de Ramboll[847]. *En cuarto lugar*, Ecuador exhibió documentos recientemente que confirman que no se informaron incidentes durante las operaciones de Petroamazonas en 30 sitios identificados para remediación. En aquellos sitios en lo que ocurrieron incidentes, esos incidentes no podrían ser la causa del daño, ya que ocurrieron en ubicaciones distintas a las de remediación del Sr. MacDonald y fueron, en cualquier caso, rápidamente remediados por Petroamazonas[848].

718. En respuesta a la invitación del Tribunal a formular comentarios sobre un posible factor de descuento general para justificar la posible contribución al daño ambiental por parte de Petroamazonas[849], Ecuador esgrime los dos argumentos descritos *infra*.

719. *En primer lugar*, tal como se explica precedentemente, Petroamazonas no causó el daño identificado por el Sr. MacDonald ni contribuyó a él y, salvo por dos áreas en Coca CPF y Coca 1, ninguna de las áreas identificadas para remediación fueron alcanzadas por los trabajos nuevos de Petroamazonas[850]. La queja de Perenco acerca de que Ecuador no divulgó algunos de los derrames de Petroamazonas se relaciona con derrames que fueron, o bien incluidos en el expediente por Ecuador, fuera del alcance de lo que el Tribunal ordenó en relación con la exhibición de documentos, o bien abordados en la carta de Ecuador de 11 de marzo de 2019 y constan ahora en el expediente[851].

720. *En segundo lugar*, debería considerarse minuciosamente la manera en la que el Tribunal determina un factor de descuento si, no obstante, el Tribunal mantuvo la opinión de

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847 *Ibid.*, párr. 70.

848 Comentarios de Ecuador sobre el Informe del Perito Independiente, párr. 71.

849 Resolución Procesal No. 17.

850 Comentarios de Ecuador sobre el Informe del Perito Independiente, párr. 74.

851 Alegato de Clausura de Ecuador, Diapositiva 47-48, Tr. (2) (MacDonald) (12 de marzo de 2019) 412:5-18.

otorgarlo. Ecuador prevé dificultades e incentivos perversos si el Tribunal atribuyera la responsabilidad por aguas subterráneas en función de la cantidad de tiempo que cada operador gestionó los Bloques porque: (i) esto premia a un operador que ocultó que había contaminación y estratégicamente niega la responsabilidad de manera tal que podría compartir responsabilidad con el siguiente operador[852]; (ii) una norma en función del tiempo lineal impondría injusta y exclusivamente a Ecuador la carga del tiempo que le tomó al Sr. MacDonald finalizar su informe; y (iii) esto asume que se genera la misma cantidad de contaminación cada año independientemente de las prácticas de cada operador, pero el Tribunal no puede asumir que Petroamazonas opere utilizando los mismos bajos estándares que emplea Perenco[853].

721. *Por último*, Ecuador confirma que no pretende doble recuperación por el daño ambiental en los Bloques. Aduce que el Sr. MacDonald no observó "el mismo daño" que el tribunal de *Burlington* y, por lo tanto, Perenco sigue siendo responsable por las áreas de remediación, volúmenes y costos adicionales o diferentes. En sus escritos, Ecuador adoptó un enfoque conservador y proporcionó una comparación sitio por sitio de áreas, profundidad, volúmenes y costos para identificar superposiciones. Sus explicaciones específicas que acompañan sobre suelo, piscinas de lodo y aguas subterráneas se exponen a continuación.

722. **Suelo**: no puede existir superposición en relación con: (i) sitios para los que el tribunal de *Burlington* no otorgó ningún costo de remediación; (ii) sitios en los que el Sr. MacDonald delineó diferentes áreas; (iii) sitios o áreas en los que las muestras del Sr. MacDonald confirmaron que la contaminación era mayor que lo que exponían las conclusiones del tribunal de *Burlington*; (iv) sitios o áreas en los que las estimaciones de la extensión vertical u horizontal de la contaminación del Sr. MacDonald y del tribunal de *Burlington* son similares, pero para los cuales la estimación de costos de remediación del Sr. MacDonald es más elevada.

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852 Comentarios de Ecuador sobre el Informe del Perito Independiente, párr. 76.

853 *Ibid.*, párr. 78.

723. **Piscinas de lodo:** el tribunal de *Burlington* otorgó solamente USD 11.106.050 para la remediación de piscinas de lodo de cinco sitios (dos de los cuales no fueron contemplados por el Perito). En cambio, el Sr. MacDonald determinó que (i) piscinas de lodo adicionales necesitan remediación, (ii) y que serían necesarios costos de remediación más elevados – respecto de los que determinó el tribunal de *Burlington*– para la remediación de piscinas de lodo de Cóndor Norte (USD 2.484.000 según el Sr. MacDonald c. USD 1.070.000 en *Burlington*) y de Payamino WTS (USD 2.978.000 según el Sr. MacDonald c. USD 2.025.000 en *Burlington*). Por lo tanto, Perenco es responsable por los costos de remediación más elevados de Cóndor Norte y Payamino WTS (es decir, USD 2.367.000) y también por la totalidad de los costos de remediación estimados para las piscinas de lodo que no cumplen con las normas en 11 sitios.

724. **Aguas subterráneas:** el tribunal de *Burlington* otorgó solamente USD 5.040.000 para la remediación de aguas subterráneas en Coca CPF, Payamino 14/20/24 y Payamino 15 (es decir, USD 1.680.000 por sitio). En cambio, el Sr. MacDonald determinó que en nueve sitios adicionales era necesaria la remediación de aguas subterráneas y estimó costos de remediación más elevados para Coca 2/CPF (USD 3.001.000 según el Sr. MacDonald c. USD 1.680.000 en *Burlington*). Perenco, por ende, es responsable por la discrepancia en los costos de remediación para Coca 2/CPF (USD 1.321.000) y también por la totalidad de los costos de remediación estimados por el Sr. MacDonald para los nueve sitios adicionales.

725. Por último, en lo que respecta a los costos de abandono reclamados por Ecuador en relación con los siete sitios del Plan de Abandono del mes de noviembre de 2008 de Perenco, que nunca se llevó a cabo (y en los que PAM nunca ha operado), Ecuador tiene derecho a todo costo de abandono adicional a los USD 929.722 otorgados por el tribunal de *Burlington*.

726. En función de sus estimaciones, por consiguiente, Ecuador tiene derecho a recuperar USD 130.801.100 por parte de Perenco[854].

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854 *Ibid.*, Apéndice A. [Traducción del Tribunal]

	COSTOS POTENCIALES DE REMEDIACIÓN MÁXIMOS SUJETOS A DOBLE RECUPERACIÓN	COSTOS POTENCIALES DE REMEDIACIÓN QUE NO ESTÁN SUJETOS A DOBLE RECUPERACIÓN
Suelo – Bloque 7	-15 714 000 USD	80 759 000 USD
Suelo – Bloque 21	-495 000 USD	1 454 100 USD
Piscinas de lodo	-8 412 000 USD	28 304 000 USD
Aguas subterráneas	-4 457 000 USD	20 284 000 USD
TOTALES	**-29 078 900 USD**	**130 801 100 USD**

2. Argumentos de Perenco

727. En síntesis, Perenco aduce que, de ninguna manera, puede hacerse responsable por un daño que no causó; no puede ser el único responsable por el daño al que otros contribuyeron; y, sin duda, no puede presumirse que sea responsable de ninguna de las condiciones observadas en los Bloques años después de su partida[855]. El hecho de que, mediante las muestras, se hallaron excesos de límites en los Bloques 7 y 21 varios años después de que la inversión de Perenco allí fuera expropiada no constituye prueba de que Perenco provocó esos excesos de límites y, sin prueba de causalidad, simplemente no existe responsabilidad.

728. Perenco argumenta que el Tribunal en su Decisión Provisional decidió que "la carga de la prueba está sobre la parte que alega algo" y que Ecuador es quien debe probar que Petroamazonas no causó los excesos de límites[856]. Que Ecuador no lo haya hecho no puede remediarse presumiendo causalidad[857]. Perenco solamente puede ser responsable *prima facie* por los excesos de límites identificados durante los derechos de operación de Perenco

855 *Ibid.*, párr. 14.

856 Véase Diapositiva del Alegato de Clausura de Perenco, pág. 59.

857 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 8.

y puede eximirse de la responsabilidad demostrando que alguien más provocó el daño. Esto debe significar que Petroamazonas en su función de operador actual es estrictamente responsable, salvo que pueda demostrar que, en este caso, Perenco causó el daño.

729. No existen más motivos para presumir que Perenco, siendo uno entre varios de los operadores pasados, sea responsable por las condiciones identificadas años después de que fuera desplazado más que presumir que cualquier otro operador previo es responsable por ellas[858]. Sería injusto hacerlo, ya que Petroamazonas ha desarrollado los Bloques de forma extensiva, ha transformado bosques en piscinas de lodo, ha perforado los suelos designados para remediación para construir vías de acceso para oleoductos nuevos y ha sufrido decenas de derrames que fueron divulgados apenas recientemente y aun más que no lo fueron[859]. Además, no existen disparidades en los hechos del caso que justifica el traslado de la carga de la prueba a Perenco.

730. Según Perenco, el ajuste de los costos de remediación por causalidad de Ramboll reduciría casi un tercio esos costos.

731. *En primer lugar*, la mayoría de los excesos de límites identificados fueron provocados por operadores previos: (i) los excesos de límites identificados por Ramboll, en gran parte, son respecto de bario que, a su vez, se relaciona con perforaciones que tuvieron lugar previo a los derechos de operación de Perenco – Perenco no perforó pozos en varios de los sitios en los que se detectaron excesos de límites respecto del suelo, incluso en siete de los ocho sitios "inactivos" identificados por el Tribunal; (ii) al menos algunas de los excesos de límites respecto de TPH asimismo provienen de la época en que Ecuador u otros operadores tenían posesión, por ejemplo, en Payamino 2-8, donde ocurrió un incidente ambiental grave durante los derechos de operación de CEPE, o Coca 6, donde ocurrieron derrames importantes en el año 1999 y posteriormente en el año 2011; (iii) ocurre lo mismo en relación con las aguas subterráneas en sitios en los que Ramboll identificó excesos de límites respecto de Bario, cuyas causas solamente pueden estar asociadas con la perforación

858 *Ibid.*, párr. 11.

859 *Ibid.*, párr. 12.

de pozos de producción, pero donde Perenco no perforó pozos; y los incidentes que podrían haber derivado en la contaminación por TPH no ocurrieron durante las operaciones de Perenco, por ejemplo, Payamino 4-14, donde Perenco no perforó pozos y no se identificó TPH en las campañas de muestreo realizadas en el período comprendido entre los años 2011 y 2013[860].

732. *En segundo lugar*, en relación con los sitios en los que Perenco podría haber contribuido a los excesos de límites, inevitablemente se presentarán dificultades al momento de atribuir la responsabilidad entre Perenco y Ecuador. Perenco aduce que la aplicación de un factor de descuento en función de la duración de los derechos de operación podría ser adecuado tanto respecto del suelo como de las aguas subterráneas. Dicho factor de descuento debe, sin embargo, considerar el historial completo de las operaciones en el sitio en cuestión, y no puede simplemente comenzar a partir del año 2002. Si se considera solamente el transcurso del tiempo, por ejemplo, en relación con las aguas subterráneas, significa que más del 70% de los costos de remediación deben asignarse a Ecuador[861].

733. *En tercer lugar*, en relación con la remediación de las piscinas de lodo, el Tribunal reconoció que la responsabilidad de Perenco se circunscribe al contenido de las piscinas de lodo construidas y utilizadas por Perenco. Perenco no puede ser considerado el único responsable, no obstante, por el material de la cubierta de piscinas (el cual Ramboll ha considerado como suelo común) que se observa en excesos de límites cerca de la superficie y que no se relaciona con la perforación realizada por Perenco de los pozos asociados[862]. Perenco, además, señala que había piscinas de lodo que ya se encontraban cerradas a la fecha de sus operaciones[863].

734. Perenco argumenta que no resulta sorprendente que contribuyera solamente a una fracción de las cuestiones identificadas en los Bloques. Las normativas y prácticas ambientales de

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860 *Ibid.*, párr. 17.

861 *Ibid.*, párr. 18.

862 *Ibid.*, párr. 19.

863 Véase Diapositivas del Alegato de Cierre de Perenco, pág. 22.

las décadas de 1980 y 1990 eran diferentes a las de la época de los derechos de operación de Perenco[864]. La participación de Perenco en los Bloques fue comparativamente limitada, tanto respecto del tiempo como de su naturaleza. La posesión de Perenco duró menos de siete años en comparación con los 49 años que el Bloque 7 y el Campo Unificado Coca-Payamino llevan en operación y los 47 años en algunas áreas en el Bloque 21. Petroamazonas, desde entonces, ha desarrollado los Bloques de forma mucho más agresiva y el impacto ha sido más del doble del que Perenco podría haber ocasionado[865].

735. Perenco propone que se adopten los siguientes principios de atribución:

(a) **Piscinas:** que se atribuya el 100% a Perenco;

(b) **Aguas subterráneas:** atribución de acuerdo a la proporción de tiempo;

(c) **Suelo:** en síntesis, según el tipo de excesos de límites respecto del suelo, que puede categorizarse de la siguiente forma: (i) solamente bario o bario con otros metales (pero sin TPH); (ii) bario solo con TPH (sin otros metales); (iii) Bario, TPH y otros metales; (iv) solamente TPH (sin Bario, sin otros metales) o solamente otros metales (sin bario, sin TPH)[866].

736. La aplicación de estos principios tendría como resultado costos de remediación por la suma de USD 25.600.465[867]:

	Estimación de Ramboll	Con Ajuste de Causalidad	Con Ajustes Técnicos y de Causalidad
Suelo	USD 98.423.000	USD 23.310.662	USD 10.468.602
Piscinas	USD 36.715.000	USD 36.607.370	USD 14.865.533

864 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 20.

865 *Ibid.*, párr. 20.

866 Tabla 1 de Metodología de Asignación de Costos de Suelo, Informe Anotado de Perenco, pág. 13.

867 Véase Alegato de Clausura de Perenco, Diapositiva 94. [Traducción del Tribunal]

	Estimación de Ramboll	Con Ajuste de Causalidad	Con Ajustes Técnicos y de Causalidad
Aguas Subterráneas	USD 24.742.000	USD 5.835.619	USD 266.330
Total	**USD 159.880.000**	**USD 65.753.651**	**USD 25.600.465**

737. Perenco argumenta que esto es razonable y probablemente elevado. La metodología que propone: (i) ajusta los volúmenes de suelos en solamente 16 de los 49 sitios de Ramboll; (ii) atribuye a Perenco el 60% del costo de Payamino 2-8; (iii) atribuye a Perenco la responsabilidad total por los excesos de límites respecto de bario en los sitios en los que Perenco realizó perforaciones, a pesar de que es posible que Petroamazonas haya realizado reparaciones allí; (iv) atribuye a Perenco la responsabilidad total por las piscinas de lodo que construyó o utilizó, aunque los informes aprobados sobre el cierre de piscinas muestran que no hubo fallas y aunque, además, es posible que Petroamazonas también las hubiera utilizado; (v) atribuye a Perenco su parte de responsabilidad por los excesos de límites respecto de metales solamente, incluso si no hay presencia de bario o de TPH que las asocie con operaciones petrolíferas; e (v) incluye una contingencia de costos de hasta un 30% a pesar de que Ramboll haya llenado espacios con otros miles de muestras[868].

738. Perenco aduce que la cifra de USD 25 millones debería ajustarse más a la luz del pago del Consorcio del arreglo en la suma de USD 42 millones. Este pago debe deducirse del total del costo de remediación para evitar una doble recuperación. Esto daría lugar a un laudo de daños por un monto equivalente a cero si se aplican todos los ajustes[869].

868 *Ibid.*, Diapositiva 95.

869 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 73.

739. Aun si los costos unitarios corregidos atribuidos a Perenco superaran los USD 42 millones, el Tribunal debería ordenar que Ecuador no puede simplemente compensar cualquier costo de remediación residual con los daños que le debe a Perenco, sino que debe depositar ese monto, junto con su parte de los costos de remediación generales en un fondo de remediación que Ecuador debe utilizar solamente para la remediación de los Bloques[870]. Esta es la única forma de garantizar que el objetivo del Tribunal de proteger el medio ambiente realmente se cumpla, que Ecuador cumpla sus promesas de utilizar los fondos para remediar, y que el proceso de reconvención completo no sea socavado por el beneficio monetario oportunista de Ecuador, el proceso no debería reducir los daños y perjuicios de Perenco sino pagarse a un fondo de remediación[871].

G. El Análisis del Tribunal

1. La opinión del Tribunal respecto del trabajo del Perito

740. Tal como puede observarse en la síntesis de los escritos de las Partes, varias cuestiones fueron planteadas por una de las Partes o la contraparte las cuales versan sobre la cuantificación de daños. El Tribunal considera que dichas cuestiones abarcaban tanto lo importante como lo irrelevante[872]. Si bien el Tribunal no analiza de forma expresa una cuestión particular planteada por una Parte, ello no significa que no haya sido considerada.

741. Para comenzar, el Tribunal analiza la calidad y confiabilidad general del Informe. El Tribunal está convencido de que el Sr. MacDonald y su equipo de Ramboll procedieron de forma imparcial e independiente, y con un alto nivel de pericia técnica. El Sr. MacDonald comenzó su trabajo con un ejercicio de revisión exhaustivo de los datos para familiarizarse con los trabajos previos llevados a cabo por los peritos de las Partes y las conclusiones del

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870 *Ibid.*, párr. 75.

871 *Id.*

872 A modo de ejemplo de esto último, el Tribunal no considera importante el intento de Perenco de subestimar el trabajo del Perito fundado en su falta de experiencia previa en Ecuador. Fueron las propias Partes quienes identificaron, entrevistaron y propusieron al Sr. MacDonald ante el Tribunal. Ambas Partes tenían conocimiento de su vasta experiencia la cual incluye trabajos en otros países de América Latina. El hecho de que no haya trabajado previamente en Ecuador no reviste importancia ni relevancia.

Tribunal en la Decisión Provisional sobre la Reconvención[873]. En su declaración testimonial durante la Audiencia Pericial , expresó que consultó también a asesores y abogados locales en Ecuador con el propósito de informarse por completo acerca del régimen regulatorio para poder dar cumplimiento a su obligación. [874] El Sr. MacDonald, al momento de estimar los costos de remediación, contrató al consultor local Hidrogeocol Ecuador para contribuir a la obtención de las cotizaciones de obras remediales[875].

742. Si bien el Tribunal analizó las cuestiones principales del derecho ambiental ecuatoriano en la Decisión Provisional sobre la Reconvención, había ciertas cuestiones secundarias que el Perito todavía debía analizar para dar cumplimiento a sus obligaciones. El Tribunal considera que él emitió decisiones razonables en el marco del derecho ambiental ecuatoriano y la práctica administrativa.

743. El Sr. MacDonald y Ramboll llevaron a cabo el ejercicio de muestreo de forma transparente y consideraron sugerencias efectuadas por los peritos y representantes de las Partes[876]. Sobre el particular, el Informe Consolidado del Perito Independiente destacó lo siguiente:

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873 Informe Pericial Consolidado, pág. 2: "Mis conclusiones y opiniones se fundan en documentos proporcionados por el Tribunal y las Partes, tal como se enumeran en la Sección 8, y se complementan con mis visitas a los representantes de los sitios en los Bloques 7 y 21 durante los meses de octubre y noviembre de 2016 y una vez más durante los trabajos de campo realizados en otoño de 2017. Asimismo, invoco varios documentos en materia regulatoria, estándares y publicaciones doctrinarias y técnicas que resultan aplicables a esta cuestión. Por último, en virtud de mis instrucciones, Ramboll generó datos independientes y llevó a cabo análisis técnicos relevantes para completar la falta significativa de datos en los estudios de suelo, y generó conjuntos de datos técnicamente válidos para sustituir los datos previos de aguas subterráneas obtenidos por las Partes. También con arreglo a mis instrucciones, Ramboll llevó a cabo las tareas necesarias para documentar el grado de cumplimiento de las piscinas de lodo, que Perenco había utilizado previamente, con las regulaciones ecuatorianas aplicables" [Traducción del Tribunal].

874 Tr. (1) (MacDonald) (11 de marzo de 2019), 269: 15-19: "...No se me impidió leer las regulaciones, interpretarlas ni mantener conversaciones con otros consultores en Ecuador, incluso con abogados en materia ambiental sobre la cual estuve indagando" [Traducción del Tribunal].

875 *Ibid.*, 85:19-21.

876 El Sr. MacDonald expresó lo siguiente: "había una comunicación fluida con las Partes, con ambos representantes legales y también con sus Peritos antes del trabajo en el sitio. Hubo sesiones informativas frecuentes con las Partes durante el trabajo en el sitio, de acuerdo, comunicaciones de rutina escritas y orales en respuesta a preguntas y una consideración minuciosa de todas las cuestiones planteadas por las Partes, con la incorporación de ajustes cuando lo consideramos razonable y apropiado". [Traducción del tribunal] Tr. (1) (MacDonald) (11 de marzo de 2019) 21:21-22:7. Véase también su Presentación Directa, Diapositiva 4, en la que mencionó las comunicaciones con las Partes antes de la realización de los trabajos en el sitio, las sesiones informativas frecuentes con las Partes durante los trabajos en el sitio, las comunicaciones de rutina

> Cabe señalar que las Partes han tenido la oportunidad de plantear preguntas y comentarios respecto de mi trabajo en el transcurso de su ejecución, incluso antes y durante la realización del trabajo de campo. Además, los representantes de las Partes estuvieron presentes durante todas las actividades realizadas en el sitio, incluso la visita exploratoria inicial a los Bloques y durante la delineación del muestreo y obtención de las muestras de todos los medios estudiados. El programa de campo se implementó en el transcurso de cuatro meses y siempre se consideraron las cuestiones planteadas por las Partes durante ese período; en algunos casos, se ajustó mi enfoque para incorporar mayor información o analizar preocupaciones (siempre que fueran razonables y técnicamente válidas). No siempre fue posible arribar a un acuerdo absoluto con ambas Partes, ya que sus compromisos con sus clientes y los enfoques estratégicos diferían de los míos. Sin embargo, y en todos los casos, se mantuvo un diálogo respetuoso con ambas Partes y, a mi saber y entender, ninguna de ellas expresó cuestiones relativas a un sesgo a favor o en contra de alguna de las Partes en este aspecto. En el Apéndice B se incluyen correspondencias, correos electrónicos y otra documentación relevante de dicho diálogo entre las Partes y mi persona, o el personal de campo[877].

744. El Sr. MacDonald reconoció que no aceptó cada sugerencia de las Partes, pero ello es apenas sorprendente dada la disparidad de los propios enfoques y conclusiones de los peritos de las Partes[878]. Además, y otra vez como era de esperarse, en pocas ocasiones, debido a consideraciones técnicas, decidió no replicar con precisión la ubicación del sitio en el cual el perito de una de las Partes o el perito de la contraparte habían tomado una muestra; este fue el caso de dos pozos de monitoreo de aguas subterráneas (en PAY01-MW03 y PAY04-MW03)[879].

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escritas y orales en respuesta a preguntas o preocupaciones planteadas por las Partes, y la consideración de todas las cuestiones planteadas por las Partes, con la incorporación de ajustes cuando era razonable.

877 Informe Pericial Consolidado, Sección 1.3. [Traducción del Tribunal]

878 *Ibid.*, pág. 1: "Los estudios técnicos subyacentes realizados por cada una de las Partes se sustentaban en marcos conceptuales diferentes: Ecuador adoptó un enfoque de diligencia debida más tradicional con actividades de estudios Fase II en el sitio, mientras que Perenco llevó a cabo estudios de confirmación de seguimiento, delineación y/o evaluación de riesgos. Además, y en varias oportunidades, las Partes interpretaron las regulaciones aplicables de formas diferentes, llevaron a cabo sus trabajos de campo y análisis de datos por medio de protocolos inconsistentes, y cuando se consideraron enfoques en materia de remediación similares, desarrollaron costos de limpieza disímiles. Los estudios y evaluaciones, de forma conjunta, no ofrecieron al Tribunal un compendio de hechos adecuados o consistentes que pudieran emplearse en sus deliberaciones". [Traducción del Tribunal]

879 Véase pág. 68 del Informe Pericial Consolidado – en dos de los sitios, las partes no habían instalado pozos en los emplazamientos - las instalaciones previas no eran apropiadas ni se ajustaban a los emplazamientos - es decir, Pay01-MW03 en CAR 66 y JAG02-MW03. Véase también la carta de fecha 28 de diciembre de 2017 la cual señala que se propuso la instalación del 65% de los pozos de aguas subterráneas en los

745. Tal como fuera indicado previamente, las Partes tuvieron la oportunidad de presentar sus escritos e incorporar comentarios al Informe Pericial. También tuvieron la oportunidad de contrainterrogar al Sr. MacDonald los dos días en los que se celebró la Audiencia Pericial. El Sr. MacDonald fue un perito prudente, creíble, objetivo y con pericia.

746. El Tribunal observa, además, que las Partes obtuvieron "muestras separadas de aguas subterráneas"[880]. Por ende, las Partes tenían libertad de utilizar sus propios análisis de laboratorio para verificar los resultados del Perito. Si bien ambas Partes tienen críticas respecto del Informe (Perenco es más crítico del trabajo que Ecuador), ninguna de las Partes recurrió - con excepción de una cuestión significativa[881] - los resultados de los ensayos de laboratorio[882]. Por lo tanto, el Tribunal considera que el manejo de la muestras - desde su

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alrededores próximos a los pozos instalados previamente por una o ambas Partes. Están ubicados cerca de los pozos - 22/34 de los pozos propuestos. Para 12 de los 34 emplazamientos ubicados en nueve sitios, 5 fueron colocados dentro de áreas de sitios que habían estado sometidas previamente a ensayos de aguas subterráneas, pero no en los mismos emplazamientos de los pozos anteriores: 4 fueron ubicados en áreas con falta significativa de datos; 3 fueron ubicados en las proximidades de los pozos anteriores que habían sido instalados previamente dentro de las piscinas de lodo y para corregir la contaminación.

880 La única reserva para esta declaración versa sobre la toma de muestras de aguas subterráneas en los lugares en donde era necesario, debido al bajo índice de flujo, para que la separación de muestras pudiera realizarse de forma secuencial. Por ende, y mediante acuerdo de las Partes, el Perito tomó la primera muestra de un pozo de aguas subterráneas en particular, la segunda muestra fue para IEMS y la tercera muestra para GSI. Véase la Presentación Directa, Diapositiva 67. [Traducción del Tribunal]

881 Perenco alegó que el tipo de ensayo que el laboratorio de Ramboll utilizó para detectar los hidrocarburos totales de petróleo (TPH; suma de GRO, DRO y MRO) "no era específico para el petróleo proveniente del crudo", "que se tenía conocimiento de que identificaba erróneamente las ceras naturales de las plantas y las ceras de parafinas insolubles, las cuales quedan comprendidas en el mismo rango de carbono que el petróleo en este análisis" y que había absolutas diferencias entre su análisis y lo concluido por GSI. [Traducción del Tribunal] El Perito analizó esta situación durante su Presentación Directa, comenzando en la Diapositiva 67, en la cual observó que "ni IEMS ni GSI han puesto a disposición sus datos, ni tampoco han ofrecido los detalles necesarios; por ende, no se pueden realizar comentarios acerca de lo que se describe como resultados realmente diferentes". [Traducción del Tribunal] Ambas partes tomaron muestras separadas de aguas subterráneas como parte del trabajo de campo de Ramboll en 2017, pero sus datos analíticos de dicho muestreo separado nunca fueron ofrecidos al Perito por ninguna de las Partes como para que pudiera evaluar las supuestas "absolutas diferencias". [Traducción del Tribunal] Además, el método de ensayos utilizado (Método EPA SW-8015C) fue acordado previamente con ambas Partes, y había sido utilizado con anterioridad por GSI en su trabajo.

882 El Tribunal considera dichas cuestiones como discrepancias de las Partes relativas al trato del Sr. MacDonald respecto de los criterios de fondo, combinando (o no) los conjuntos de datos, el uso del método de "límite superior predictivo", la "cuestión cromatograma", el uso de inferencias, herramientas predictivas, macro-delineación, y contingencias para estimar el grado de contaminación (y análisis de sensibilidad para confirmar estimaciones), así como los méritos y deméritos de diversos métodos de composición de las muestras de suelo (entre otros) que quedan comprendidos directamente en el campo de la pericia e interpretación de los

extracción en el sitio, el transporte hacia ALS y hasta su posterior análisis en Houston, Texas - fue realizado conforme a las mejores prácticas y, por consiguiente, ofreció una evaluación técnica de las muestras que fue válida, precisa y confiable.

747. Para estar seguro, y al igual que las Partes, el Tribunal tenía preguntas sobre ciertas decisiones adoptadas por el Perito. Ello era inevitable, dada la diversidad de incertidumbres inherentes a la estimación de la responsabilidad jurídica de un único operador por cierta contaminación que derivó de las operaciones del yacimiento petrolífero realizadas en algunas partes de los Bloques durante varios años (en particular en el Bloque 7 y el yacimiento unificado de Coca-Payamino)[883]. Las opiniones del Tribunal sobre la determinación de ciertas cuestiones controvertidas por parte del Perito se analizan *infra*.

748. En el marco de sus deliberaciones, el Tribunal revisó el Informe Consolidado del Perito Independiente, los escritos independientes de las Partes, así como las declaraciones testimoniales y las presentaciones de cierre realizadas durante la Audiencia Pericial. La mayoría de las preguntas y excepciones que las Partes han planteado versan sobre cuestiones técnicas que quedan comprendidas en el marco de la pericia y valoración del Perito y el Tribunal considera que no resulta pertinente cuestionar sus determinaciones técnicas. Este es el motivo por el cual fue designado, en primer lugar: para proporcionar, de forma objetiva y neutral, su pericia y valoración las cuales el Tribunal considera que los peritos de las Partes no habían podido ofrecer.

749. Por lo tanto, el Tribunal considera necesario analizar sólo dos conjuntos de cuestiones principales. El primer conjunto de cuestiones versa sobre la forma en la cual determinar el grado de responsabilidad de Perenco en la remediación de la contaminación de los Bloques (entre Perenco y sus predecesoras y sucesoras). El segundo conjunto de cuestiones versa

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resultados. [Traducción del Tribunal] Estas son cuestiones técnicas por excelencia que el Perito analizó y el Tribunal acepta sus opiniones sobre dichas cuestiones.

883 Si bien hubo perforaciones exploratorias en los yacimientos de Yuralpa y Oso, Perenco fue el primer operador que efectivamente desarrolló dichos yacimientos.

sobre el alcance de las obligaciones del Perito y si procedió de forma consistente con dichas obligaciones.

2. Causalidad y atribución de la responsabilidad

750. La estimación de los costos de remediación relativa a la "contaminación total medida[884] " realizada por el Sr. MacDonald en los Bloques 7 y 21 asciende a USD 159.881,00[885]. La pregunta central del Tribunal radica en determinar cuánto de esta contaminación es responsabilidad de Perenco[886].

751. El Tribunal considera que el trabajo del Perito debería hacer hincapié en estimar la contaminación total medida en los Bloques, y dejar que el Tribunal decida las cuestiones de causalidad y división resultante de la responsabilidad en materia de costos de la remediación entre Perenco y otros operadores[887].

752. La Decisión Provisional concluyó lo siguiente respecto de la forma en la cual se podría determinar la responsabilidad de Perenco:

> "Si bien el Tribunal concuerda con Perenco en que no puede suponerse que Perenco es autora de todos los daños que han sido detectados, una vez que se demuestra un exceso regulatorio derivado de una actividad potencialmente peligrosa, Perenco es responsable *prima facie* de esos daños[888].

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884 "Contaminación total medida", significa para el Tribunal el grado de contaminación que el Perito definió fundado en estudios previos y su muestreo en los Bloques según las instrucciones del Tribunal. Debido a las limitaciones de su obligación, no debe considerarse como una estimación completa de la contaminación total en los Bloques porque podría haber contaminación que no fue detectada por ninguno de los peritos de las Partes, y el trabajo del Sr. MacDonald estaba restringido a los sitios que ellos habían analizado [Traducción del Tribunal].

885 Informe del Perito Independiente, Tabla 6.11. Síntesis de las Estimaciones de los Costos de Remediación

886 A lo largo de la presente sección del Laudo, el Tribunal analiza la "responsabilidad" de los diferentes operadores. [Traducción del Tribunal] Por supuesto, el Tribunal sólo tiene a Ecuador y Perenco ante él. Puede identificar la contaminación atribuible a los actos de las predecesoras de Perenco, pero carece de jurisdicción para evaluar los daños pagaderos por aquellas personas que no son parte del arbitraje.

887 Decisión Provisional, párr. 591: "...el Tribunal reconoce que las condiciones que probablemente se den en el año 2015 pueden haber sido afectadas por las acciones de Petroamazonas. Puede ser necesario, por lo tanto, que el Tribunal determine el grado de responsabilidad de Perenco por tal contaminación para garantizar que no se lo esté responsabilizando por los actos de Petroamazonas".

888 *Ibid.*, párr. 372.

> Por lo tanto, el Tribunal se ve persuadido a emplear la sólida presunción refutable de que si existe un exceso regulatorio, dicho exceso por sí solo demuestra la existencia de culpabilidad. Un enfoque alternativo sería demasiado costoso para un demandante ya que probablemente no cuente con pruebas suficientes para demostrar que el operador incumplió su deber de cuidado en muchas instancias, sino en la mayoría, en que han ocurrido excesos regulatorios El Tribunal considera que los excesos regulatorios indican fallas operativas y, por lo tanto, deberían considerarse incumplimientos con el deber de cuidado[889].
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> En conclusión, si ocurrió un exceso regulatorio, debe considerarse que Perenco incumplió con el deber requerido de cuidado y será responsable a menos que pueda demostrar sobre una preponderancia de la prueba: (i) la ocurrencia de un acontecimiento de *force majeure*; (ii) que no incumplió con el deber de cuidado respecto de esa instancia específica de contaminación; o (iii) que alguna otra persona causó el daño[890]. [Énfasis agregado]

753. En sus comentarios al Informe del Perito Independiente y durante la Audiencia Pericial, Perenco se centró principalmente en persuadir al Tribunal que otros operadores eran responsables de la mayor parte de la contaminación que el Perito había determinado. El caso de Perenco se fundaba en que su séptimo año de operación había quedado comprendido entre diversas operaciones llevadas a cabo por otros operadores durante plazos más prolongados y, por lo tanto, la mayor parte del daño al cual el Perito arribara en su conclusión debía atribuirse a dichos otros operadores.

754. En primer lugar, Perenco arguyó que la mayoría de los excesos identificados eran atribuibles a los operadores anteriores porque se identificó presencia de Bario, que se asocia a la perforación, y la mayor parte de la perforación del pozo tuvo lugar con anterioridad a la operación de Perenco. Además, Perenco arguyó que, al menos, algunos de los excesos de TPH provenían de la gestión de Ecuador u otros operadores, durante la cual ocurrieron la mayor cantidad de incidentes[891].

755. En segundo lugar, para aquellos sitios en los cuales resulta difícil atribuir responsabilidad entre Perenco y Ecuador, Perenco alegó que sería apropiado aplicar un factor de descuento

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889 *Ibid.*, párr. 374.

890 *Ibid.*, párr. 379.

891 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 17.

fundado en la duración de la operación, considerando la totalidad de la historia de la operación en un sitio determinado.[892]

756. En tercer lugar, Perenco aceptó su responsabilidad respecto de los contenidos de las piscinas de lodo que había construido y utilizado. Sin embargo, alegó que no se le puede atribuir la totalidad de la responsabilidad por el material de recubrimiento de las piscinas que presentaron excesos cerca de la superficie los cuales no se relacionan con la perforación que Perenco llevara a cabo en los pozos respectivos[893]. Asimismo, Perenco negó responsabilidad por las piscinas de lodo que ya se encontraban cerradas a la fecha de sus operaciones[894].

757. En el párrafo [735] *supra*, el Tribunal ha reproducido los principios propuestos por Perenco para la atribución de responsabilidad, los cuales no serán repetidos aquí[895].

758. Ecuador adoptó una posición diferente a la de Perenco en la cual arguye que Perenco tenía el deber de mantener los Bloques en buenas condiciones, lo cual incluía la remediación de cualquier incidente ambiental así como el emplazamiento y construcción adecuadas y/o el cierre de las piscinas de lodo[896]. Sin embargo, Perenco "llevó a cabo operaciones de bajo costo haciendo hincapié en la extracción de todo el crudo posible, en el menor tiempo posible y al mínimo costo, sin la menor consideración por el medio ambiente"[897]. Ecuador

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892 *Ibid.*, párr. 18.

893 *Ibid.*, párr. 19.

894 Véanse Diapositivas del Alegato de Clausura de Perenco, pág. 22.

895 *Ibid.*, pág. 93.

896 Comentarios de Ecuador sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 2: "Es evidente que la referida vasta contaminación no sorprendió a Perenco debido a su gestión en los Bloques establecida, previamente, por debajo de los estándares; los diversos derrames y otros incidentes ambientales durante su operación; sus pasos inadecuados para remediar dichos incidentes (en la medida en que fueron adoptados); su práctica de ocultamiento (o, como mínimo, falta de información) de dichos incidentes a las autoridades; sus piscinas de lodo emplazadas, construidas y/o cerradas de forma inadecuada; y su falta de mantenimiento apropiado, en general, de las instalaciones de los Bloques, incluso las líneas de flujo, los oleoductos y los tanques que contienen crudo". [Traducción del Tribunal]

897 *Ibid.*, párr. 2. [Traducción del Tribunal]

arguyó que Perenco no había demostrado que la contaminación (que constituía un mínimo estimado[898]) fue originada por los operadores anteriores o por Petroamazonas.

759. En primer lugar, según Ecuador, los documentos contemporáneos no demostraron cuestiones ambientales en los Bloques cuando Perenco se hizo cargo de las operaciones. Además, demostraron que las condiciones de los Bloques empeoraron y se produjeron incidentes durante la operación de Perenco[899]. Asimismo, el argumento de Perenco que le atribuye responsabilidad a los otros operadores fundado en la presencia de bario carece de sustento[900] y, en cualquier caso, podría haberse originado por las reparaciones y el transporte de lodos de perforación para su almacenamiento por parte de Perenco[901]. Perenco podría haber llevado a cabo ensayos para evaluar el momento en el que se producían los excesos de TPH (pero no fue así). Además, los incidentes que tuvieron lugar con anterioridad a la operación de Perenco se produjeron fuera de los emplazamientos sujetos a remediación considerados por el Sr. MacDonald[902]. En cualquier caso, Perenco heredó toda la responsabilidad ambiental sobre cualquier condición preexistente presente en los Bloques[903].

760. Además, Ecuador arguyó que Perenco tampoco puede atribuir la contaminación a Petroamazonas porque 11 de los sitios y todas las piscinas de lodo identificadas como sujetas a remediación no fueron operadas ni utilizadas por Petroamazonas[904]. El ejercicio de llenado de espacios del Sr. MacDonald confirmó la contaminación hallada por IEMS y no hubo nuevos incidentes de contaminación observados tanto durante las inspecciones

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898 Tal como Ecuador declaró en sus comentarios en el Informe Pericial Consolidado, pág. 19: “Por ende, las conclusiones del Sr. MacDonald deberían considerarse como las mínimas necesidades halladas en materia de remediación”. [Traducción del Tribunal]

899 Comentarios de Ecuador sobre el Informe del Perito Independiente de fecha de fecha 22 de febrero de 2019, párrs. 50-53.

900 *Ibid.*, párr. 56.

901 *Id.*, párr. 56.

902 *Ibid.*, párr. 55.

903 Alegato de Clausura de Ecuador, Diapositiva 10.

904 Comentarios de Ecuador sobre el Informe del Perito Independiente de fecha de fecha 22 de febrero de 2019, párrs. 66 y 68.

posteriores al mes de julio de 2009 como las realizadas por Ramboll[905]. Los incidentes que tuvieron lugar durante la operación de Petroamazonas se originaron en diversos emplazamientos o eran tales que no podrían haber causado la contaminación hallada y, en cualquier caso, fueron remediados de inmediato[906].

761. En segundo lugar, Ecuador alegó que la atribución de responsabilidad respecto de aguas subterráneas fundada en el plazo de cada operación: (i) premiaría a un operador que ocultó la existencia de contaminación por años y procuraría negar estratégicamente la responsabilidad de manera que podría compartir la responsabilidad con el siguiente operador[907]; (ii) también impondría injustamente sólo sobre Ecuador la carga respecto del tiempo que le tomó al Sr. MacDonald finalizar su informe; y (iii) supondría que se genera la misma cantidad de contaminación cada año independientemente de las prácticas de cada operador, pero el Tribunal no puede asumir que Petroamazonas opera conforme a los mismos bajos estándares que Perenco[908].

762. En tercer lugar, Ecuador adujo que Perenco es responsable, al menos, de la remediación completa de todas las piscinas de lodo estudiadas por el Sr. MacDonald dado que: (i) recae sobre Perenco la carga de la prueba en relación con la colocación de piscinas adecuadas ya que debería tener tales registros, pero no ha cumplido con dicha carga[909]; y (ii) existían muchas más piscinas de lodo que el Sr. MacDonald debería haber estudiado, pero no lo hizo[910].

(a) Las Conclusiones del Tribunal

763. El Tribunal considera que, tal como se reflejara en el enfoque general de Perenco, hay dos aspectos temporales respecto de la cuestión de causalidad. En consecuencia, el Tribunal comienza con dos principios fundamentales.

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905 *Ibid.*, párr. 70.
906 *Ibid.*, párr. 71.
907 *Ibid.*, párr. 76.
908 *Ibid.*, 78.
909 Alegato de Clausura de Ecuador, Diapositiva 18.
910 *Ibid.*, Diapositiva 19.

764. En primer lugar, el Tribunal concuerda con Perenco en que no se le puede atribuir la responsabilidad por cualquier contaminación causada por Petroamazonas luego de que se hiciera cargo de los Bloques en julio de 2009. Tal como expresara la Decisión Provisional sobre la Reconvención:

> 368. El Tribunal reconoce que con el paso del tiempo, en el transcurso de la realización de operaciones petrolíferas, Petroamazonas puede haber causado derrames y otros tipos de contaminación. El período clave fue aquel comprendido entre julio de 2009 y el momento en que los peritos de las Partes tomaron sus muestras. Durante este período, es posible que la condición de los Bloques pueda haber sido afectada negativamente por el operador posterior y esto debe ser tenido en cuenta. En la medida en que exista alguna prueba de daño ambiental en los Bloques durante el período posterior al 16 de julio de 2009, Perenco no tiene responsabilidad. De conformidad con la Constitución de 2008, Petroamazonas es objetivamente responsable de toda contaminación que haya ocurrido en ese período[911].
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> Y:
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> 370. El Tribunal concluye que la única obligación de remediación que Perenco puede tener es por excesos regulatorios que datan de un momento previo a las actividades de Petroamazonas y que no han sido sucedidas por los nuevos trabajos de Petroamazonas[912]. [Énfasis agregado]

765. En segundo lugar, si bien Perenco es *prima facie* responsable por la totalidad de la contaminación en los Bloques, no se le puede atribuir responsabilidad por cualquier contaminación que las pruebas demuestran que fueron originadas por otros operadores con anterioridad a su inicio de las operaciones en el año 2002.

766. El Tribunal analizará cada cuestión por separado.

(b) La cuestión de Petroamazonas

767. El Tribunal es consciente de la posibilidad de que dada la expiración del plazo, Petroamazonas podría haber causado la contaminación que erróneamente se podría atribuir a Perenco. Respecto de las prácticas de muestreo, hay dos períodos de tiempo que deben considerarse. En primer lugar, y debido al plazo de 15 meses entre la suspensión de las

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911 Decisión Provisional, párr. 368.

912 *Ibid.*, párr. 370.

operaciones de Perenco y el comienzo de las primeras actividades de muestreo de IEMS, resulta posible que la contaminación originada por Petroamazonas haya sido descubierta por los peritos de las Partes cuando tomaron las muestras en los Bloques. En segundo lugar, también es posible que los sitios en los que el Perito Independiente del Tribunal tomó las muestras puedan haber sido contaminados durante el período entre la finalización del muestreo de los peritos de las Partes y el momento en el cual Ramboll realizó su muestreo.

768. Ello no constituye una cuestión académica. Durante la audiencia original sobre reconvención, Perenco presentó al Tribunal ejemplos en los cuales Petroamazonas había sufrido derrames luego de que se hiciera cargo de las operaciones en los Bloques[913]. Perenco, en sus escritos sobre el Informe del Perito Independiente y durante la Audiencia Pericial , continuó haciendo referencia a las pruebas en materia de derrames causados por Petroamazonas[914].

769. En el período que precedió a la Audiencia Pericial de marzo de 2019, el Tribunal consideró si sería apropiado contar con un factor de descuento de algún tipo, teniendo en cuenta las respectivas gestiones de ambos operadores en los Bloques, pero no arribó a ninguna conclusión en firme al respecto. En la Resolución Procesal No. 17, emitida luego de la recepción del Informe del Perito Independiente y con anterioridad a la Audiencia Pericial , el Tribunal invitó a las Partes a analizar la cuestión en sus escritos. A saber:

> Respecto de la cuestión independiente planteada en la correspondencia, y en principal, la pregunta sobre la solución de las cuestiones en materia de

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913 Véase Escrito Posterior a la Audiencia sobre Reconvención de Perenco de fecha 6 de noviembre de 2013, notas al pie 96 y 100, que hace referencia a CE-CC-360 en virtud del derrame de Petroamazonas en el año 2012 en Yuralpa Pad E y CE-CC-357 en virtud del derrame de Petroamazonas en el año 2011 en Coca 6.

914 Véase Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 12: “Ha sufrido, además, docenas de derrames que sólo dio a conocer recientemente, e incluso más derrames que no divulgó. Por ejemplo, en mayo de 2012, El Comercio informó sobre el ´Quinto Derrame de Hidrocarburos en Ecuador en este Año´, indicando que ´a razón de un derrame por mes ha ocurrido [en los Bloques de petróleo] de Petroecuador y Petroamazonas´, incluso en el Bloque 21. Petroamazonas informó también derrames ocurridos el 1 de marzo de 2015 en emplazamientos no divulgados en Payamino; el 16 de setiembre de 2009 en Payamino; y el 4 de enero de 2014 en Oso 9” [Traducción del Tribunal]. Véanse también las notas al pie 18 y 20 que hacen referencia a lo siguiente: CE-CC-438 (Informe de Derrame en 2011 para Coca 6), CE-CC-439 (Informe de Investigación por Incidente en 2011 en Coca 18-19), CE-CC-440 (Informe de Derrame en 2012 para Yuralpa Pad E), CE-CC-443 (Informe de Investigación en 2016 para Payamino B) y CE-CC-444 (Informe de Investigación en 2017 para Oso CPF).

> causalidad para aquellos sitios que fueron operados sucesivamente por Perenco y Petroamazonas, el Tribunal ha considerado la forma en la cual atribuir responsabilidad en tales circunstancias. Considera que la cuestión será clarificada, en cierta medida, mediante la exhibición de documentos contemplada en la presente resolución. Una vez que se disponga de una visión más acabada de la posible contribución de Petroamazonas respecto de cualquier contaminación identificada, el Tribunal estará en mejores condiciones para determinar cómo proceder. El Tribunal recuerda a las Partes que la estimación de daños no constituye un ejercicio científico y podría ser necesaria la utilización de un factor de descuento general para arribar a un laudo justo y razonable. Se alienta a las Partes a analizar dicha cuestión en sus respectivos escritos[915]. [Énfasis agregado]

770. Como resultado de la exhibición de documentos, los escritos de las Partes orientados a esta cuestión y la declaración testimonial, y las presentaciones orales durante la Audiencia Pericial, el Tribunal ha arribado a una mejor comprensión de la forma en la cual analizar la cuestión de Petroamazonas.

771. Respecto del primer período de tiempo, el Tribunal observa que el plazo transcurrido entre que Petroamazonas se hizo cargo de la operación y el primer muestreo de IEMS fue de 15 meses, aproximadamente[916]. Si bien no se puede descartar por completo que cierta contaminación fue originada por Petroamazonas con anterioridad al comienzo del trabajo de IEMS (o durante el plazo en el cual IEMS y GSI finalizaron sus estudios)[917], el Tribunal está convencido de que resulta improbable que uno u otro de los peritos de las Partes, en particular los expertos de Perenco, hayan podido identificar cualquier contaminación nueva originada luego de la operación de Perenco y la haya incluido como causada por Perenco[918].

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915 Resolución Procesal No. 17, párr. 15. [Traducción del Tribunal]

916 El trabajo de IEMS comenzó en el último trimestre del año 2010 y, a pesar de que IEMS no identificó todas las áreas respecto de las cuales sostuvo - en última instancia - que se había encontrado contaminación, efectivamente llevó a cabo una gran cantidad de muestreos iniciales durante el período comprendido entre octubre y noviembre de 2010.

917 Véase *por ejemplo* GSI ER I, párr. 201, en el que se observan los resultados de sus inspecciones al sitio y se demuestran las deficiencias operativas, las cuales, en opinión de GSI, son inherentes a las prácticas de la operación de Petroamazonas. Véase también Saltos WS I, párrs. 302 y 310-318.

918 Ecuador arguyó que las áreas evaluadas por el Perito eran las mismas que IEMS había evaluado a partir del año 2010. "Además, no hay ninguna contaminación reciente por parte del operador actual que haya sido (sic) advertida por alguno de los actores que han inspeccionado los Bloques desde el año 2010 (incluso el Consorcio de peritos y representantes) ni tampoco informada por el Sr. MacDonald durante su visita en los

772. Respecto del segundo período de tiempo (el plazo de la operación de Petroamazonas entre la finalización de los trabajos de IEMS y GSI y el comienzo del trabajo del Sr. MacDonald), el Tribunal observa que los "límites territoriales" [Traducción del Tribunal] del ejercicio de muestreo del Perito Independiente fueron definidos principalmente por IEMS (ya que GSI consideraba su obligación, en esencia, como aquella que debía verificar los sitios en los que previamente IEMS había procedido con el muestreo)[919]. En la medida en que se hayan suscitado contaminaciones sobrevenidas originadas por Petroamazonas, el Tribunal considera que el riesgo de atribuir dichas contaminaciones a Perenco ha sido reducida sustancialmente por la obligación circunscripta del Perito de proceder con el muestreo únicamente en aquellos sitios que habían sido muestreados previamente por los peritos de las Partes (salvo las piscinas de lodo de Perenco; véase *infra*) y por otros pasos que se explican también *infra*.

773. Si se hubiera instruido al Perito Independiente la realización de un estudio *de novo*, bien podría haber identificado la contaminación causada por Petroamazonas la cual tuvo lugar fuera de los sitios identificados previamente por IEMS y GSI. Sin embargo, este mandato restringido reduce la probabilidad de que ello ocurriera. Si bien los datos iniciales de IEMS fueron obtenidos dentro de un período de tiempo relativamente corto luego del cese de las operaciones de Perenco, la identificación de IEMS de supuestos sitios contaminados sirve en efecto como "condiciones ambientales de línea base" [Traducción del Tribunal] . Los derrames y emisiones de Petroamazonas que tuvieron lugar fuera de los sitios en los que IEMS y/o GSI realizaron sus muestreos no eran legalmente relevantes para la tarea del Perito Independiente.

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meses de octubre y noviembre de 2016 ni durante su trabajo de campo de 4 meses en otoño del año 2017". [Traducción del Tribunal] Informe Pericial Consolidado, pág. 10.

919 Decisión Provisional, párr. 234: "En su primer informe del 20 de septiembre de 2012, GSI señaló que se le había dado la tarea de ´proporcionar una evaluación objetiva del trabajo dirigido por IEMS y, al mismo tiempo, obtener una evaluación integral de las condiciones ambientales actuales para cada una de las 74 instalaciones en yacimientos petrolíferos investigadas por IEMS´". El Informe Pericial Consolidado observó lo siguiente en la página 14: "El enfoque principal de GSI fue refutar las CAR o refinar la medida de la contaminación identificada por IEMS (esta no fue su única actividad; GSI identificó también CAR adicionales fundado en sus propias observaciones de campo y diligencia debida)" [Traducción del Tribunal].

774. La única posibilidad para que el Perito Independiente identificara erróneamente más contaminación reciente por parte de Petroamazonas respecto de Perenco sería si Petroamazonas hubiera contaminado un sitio en el cual los excesos fueron identificados previamente por alguno o ambos peritos de las Partes y el Perito no pudo diferenciar entre una contaminación nueva y otra anterior.

775. La instrucción del Tribunal en la Decisión Provisional sobre la Reconvención que constituyó una salvaguarda en contra de dicha posibilidad reza lo siguiente:

> Se les permitirá a las Partes estar presentes cuando el perito y su equipo desarrollen las investigaciones necesarias. Además, las Partes recibirán una copia del informe pericial y se les permitirá realizar observaciones sobre él a su debido tiempo[920].

776. Las Partes aceptaron dicha invitación. El Perito Independiente observó que analizó varias cuestiones inherentes al muestreo con los representantes de las Partes durante el proceso de organización de su trabajo y que los representantes de las Partes estuvieron presentes cuando el Perito Independiente y/o su equipo realizaron las actividades en los Bloques[921]. Se describe en el Informe Consolidado del Perito Independiente un ejemplo de la capacidad de las Partes para controlar el trabajo de campo de Ramboll. El Perito observó que cuando se procedía a muestrear la superficie de los suelos en el sitio Gacela 02, GSI expresó su preocupación sobre los suelos que posiblemente hayan sido afectados por las recientes actividades de quema para el control de la vegetación que supuestamente se realizaron con combustible diésel como acelerante[922]. En consecuencia, Ramboll obtuvo muestras adicionales de los 10 cm superiores del intervalo del suelo; el Sr. MacDonald informó que las Partes coincidieron en que los resultados de estas muestras satisfarían la preocupación de GSI[923].

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920 *Ibid.*, párr. 588. Véase también párr. 611(19).

921 Informe Pericial Consolidado, pág. 3. Tr. (1) (MacDonald) (11 de marzo de 2019), págs. 129, 130 y 131.

922 *Ibid.*, pie de pág. 191.

923 *Id.*

777. Dada esta consideración a los detalles, y en opinión del Tribunal, resulta muy improbable que GSI no haya podido advertir a Ramboll la presencia de contaminación reciente si hubiera identificado alguna. No hay ninguna indicación de que hayan procedido en tal sentido[924]. Por ende, la presencia de los representantes de las Partes sirvió para reducir aun más la posibilidad de que cualquier contaminación causada por Petroamazonas desde el momento en que se realizaron los muestreos de IEMS y GSI sea atribuida erróneamente a Perenco.

778. No obstante, y debido a que no se puede descartar una estratificación de derrames no detectada, el Tribunal adoptó otra medida más tendiente a acordar con Perenco que los informes de derrames y documentos relacionados de Petroamazonas deberían ser exhibidos a Perenco. Esto permitiría a la Partes un control cruzado de los sitios identificados en dichos documentos respecto de los sitios identificados por el Perito Independiente para determinar si alguna de las contaminaciones que había identificado podría haber sido originada por Petroamazonas.

779. El Tribunal concluyó que la solicitud inicial de Perenco respecto de la exhibición de documentos era excesivamente amplia ya que solicitaba al Tribunal lo siguiente:

> ...instruir a Ecuador la inmediata exhibición de toda la documentación relevante inherente a la condición ambiental de los Bloques con posterioridad a julio de 2009. En virtud de la información obrante en el expediente y la información pública disponible, dicha documentación debería incluir informes ambientales anuales, auditorías ambientales

924 En cambio, Perenco y sus representantes técnicos plantearon varias excepciones fundados en que Ramboll realizaba los muestreos en emplazamientos en los cuales los trabajos previos de IEMS y GSI no revelaron excesos, o los cuales ya se habían delineado correctamente, o que se seleccionaban emplazamientos que no estaban comprendidos dentro de los emplazamientos sujetos a muestreo identificados previamente por IEMS o GSI, lo cual, según la alegación de Perenco, excedía el alcance de la obligación del Perito (véase la correspondencia de 13 de setiembre de 2017 y 14 de noviembre de 2017). Además, Perenco cuestionó la intención de Ecuador de que Ramboll considerara emplazamientos en los cuales había "pruebas oculares" de posible contaminación (véase su carta de 14 de noviembre de 2017). [Traducción del Tribunal] El Tribunal observa la carta de Ramboll de 28 de diciembre de 2017 en respuesta a la carta de Perenco de 14 de noviembre de 2017, en la cual el Perito indicó que se habían mantenido diálogos consistentes con las Partes durante el proceso de implementación y determinación del alcance relativo a las actividades de campo, y que los representantes técnicos de las Partes estuvieron presentes cuando los emplazamientos de los pozos de monitoreo y otros emplazamientos de ensayo fueron marcados en campo en agosto, así como durante la totalidad del programa de muestreo, incluso en el transcurso del control de las aguas subterráneas en las instalaciones de pozos, que comenzaron a mediados de setiembre de 2017.

> semestrales, informes de control interno, registros de los informes de derrames de petróleo, órdenes de trabajo emitidas por Petroamazonas a los contratistas encargados de evaluar, mitigar, gestionar o remediar posibles impactos ambientales en los Bloques, y cualquier documentación transaccional con operadores nuevos que describa las condiciones ambientales de los Bloques con posterioridad a julio de 2009[925].

780. El Tribunal decidió que, si bien esta solicitud estaba acertadamente motivada y fue realizada de forma oportuna, debería hacer hincapié de forma más precisa respecto de si Petroamazonas originó derrames *en los sitios que el Perito Independiente identificara en particular como sujetos a remediación*. Resultó innecesario exigir la exhibición de documentos relativos a los sitios que fueron excluidos de su investigación[926] o en los cuales el Perito Independiente no halló contaminación porque los demás Bloques no estaban incluidos en el marco de su obligación. Por lo tanto, la Resolución Procesal No. 17 disponía lo siguiente:

> ...tal como contemplara la oferta de Ecuador citada *supra* en el párrafo 11 [de la Resolución Procesal No. 17], sólo los documentos relativos a dichos sitios son relevantes a los efectos de la estimación de daños. El Tribunal considera que Perenco tiene derecho a acceder a dichos documentos y no sería una carga excesiva para Ecuador exhibirlos de forma periódica[927].

781. Luego de la emisión de la orden (en vigor a partir de 29 de enero de 2019), Ecuador comenzó a exhibir documentos de respuesta, principalmente, los informes ambientales anuales de los Bloques 7 y 21 así como los informes de derrames y limpieza para los sitios identificados por el Perito Independiente del Tribunal como sujetos a remediación[928]. Ecuador informó al Tribunal que a dos semanas de emitida la orden había ofrecido 120 documentos relativos a incidentes ambientales durante la operación de Petroamazonas en

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925 Resolución Procesal No. 17, párr. 2. [Traducción del Tribunal]

926 Véase Informe Pericial Consolidado, sección 4.2, Análisis del Sitio, que enumera en la Tabla 4.1, Sitios Omitidos del Estudio de Ramboll, en la Tabla 4.2, Sitios en los Cuales No Se Realizaron Estudios de Suelo Adicionales, y en la Tabla 4.3, Sitios en los Cuales No Se Realizaron Estudios de Piscinas de Lodo Adicionales, y la sección 4.2.4, que enumera aguas subterráneas excluidas de consideraciones adicionales.

927 Resolución Procesal No. 17, párr. 14. [Traducción del Tribunal]

928 Véase carta de Ecuador de 29 de enero de 2019, pág. 1.

los dos Bloques[929]. Ecuador, por medio de una carta de fecha 7 de febrero de 2019, señaló que había exhibido 214 documentos de respuesta a Perenco (y que ello había sido reconocido por Perenco el 5 de febrero de 2019[930])[931]; y, además, Ecuador proporcionó documentos adicionales a Perenco el 12 de febrero de 2019[932]. Los comentarios de Ecuador

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929 Véase carta de Ecuador de 31 de enero de 2019, pág. 1. "Ecuador informa al Tribunal que exhibió documentos adicionales en el día de hoy (incluso la Resolución No. 099-PAM-EP-CON-2017 de Petroamazonas mencionada por Perenco en su carta de 25 de enero de 2019). Todavía se encuentra en proceso una búsqueda razonable de posibles documentos de respuesta; Ecuador exhibirá cualquier documento de respuesta adicional (si los hubiere) sin ninguna demora" [Traducción del Tribunal].

930 Véase carta de Perenco de 5 de febrero de 2019: "Desafortunadamente, si bien Ecuador exhibió 214 documentos el 29 y 31 de enero de 2019, dicha exhibición no es completa ni satisfactoria. Ecuador ha exhibido los informes ambientales anuales para los Bloques 7 y 21, así como algunos registros de incidentes relativos a derrames y limpieza que tuvieron lugar a partir del año 2009. Sin embargo, no ha exhibido lo siguiente: (i) ningún informe semestral para los Bloques 7 y 21, (ii) informes de otros incidentes ambientales que tuvieron lugar con posterioridad a julio de 2009 en los sitios que el Sr. MacDonald ha identificado para remediación, ni (iii) órdenes de trabajo emitidas por Petroamazonas a los contratistas encargados de evaluar, mitigar, gestionar o remediar posibles impactos ambientales en los sitios relevantes, y que podrían contener información sobre los costos de remediación en los que Petroamazonas ha incurrido realmente para analizar los impactos ambientales en los sitios pertinentes. Debido a los motivos que Perenco ha expuesto con anterioridad y que el Tribunal reconociera en la Resolución Procesal No. 17, esta información es clave para garantizar que no se atribuya responsabilidad a Perenco por los actos de su sucesor - en especial, cuando dicho sucesor es Ecuador, la contraparte del presente caso. La exhibición tardía e incompleta de Ecuador es altamente perjudicial para Perenco y sumamente injusta. Ecuador debe realizar de inmediato una exhibición más completa". [Traducción del Tribunal]

931 Carta de Ecuador de 7 de febrero de 2019, pág. 1, en respuesta a la queja de Perenco: "A pesar del reconocimiento de ya haber recibido 214 documentos de respuesta por parte de Ecuador con poca antelación, Perenco califica la exhibición de Ecuador como ni 'completa ni satisfactoria' en un intento equivocado de desalentar al Tribunal respecto de la autorización relativa a la incorporación de los registros de las reparaciones realizadas por Perenco. Aun así, Ecuador ha cumplido (y continua cumpliendo en las medida de sus posibilidades) con la Resolución Procesal No. 17" [Traducción del Tribunal]. Ecuador agregó lo siguiente: "Ecuador comenzó a divulgar los documentos de respuesta a Perenco de forma periódica el 29 de enero de 2019 (es decir, sólo 14 días después de la Resolución Procesal No. 17) mediante la presentación de un primer compendio de alrededor de 100 informes sobre derrames y limpieza acaecidos con posterioridad a julio de 2009. Posteriormente, el 31 de enero de 2019, Ecuador divulgó más de 100 documentos (incluso las auditorías ambientales anuales de los Bloques 7 y 21 a partir del año 2010). En síntesis, Ecuador ha exhibido más de 200 documentos en el término de dos semanas a partir de la orden del Tribunal [Traducción del Tribunal]. Por último, Ecuador respondió a la queja de Perenco relativa a que no ofrecía informes de los sitios relevantes. "Ecuador puede confirmar que no hay registros de derrames durante la operación de Petroamazonas en 24 sitios. Por lo tanto, no hay informes adicionales de derrames para divulgar" [Traducción del Tribunal]. Por último, Ecuador indicó que Petroamazonas ha advertido recientemente que identificó documentos de respuesta adicionales incluso las auditorías bienales realizadas en los Bloques 7 y 21 que Ecuador divulgaría de inmediato tan pronto como sean recuperados.

932 Véase carta de Ecuador de 12 de febrero de 2019, la cual señaló lo siguiente: "Por la presente, Ecuador informa al Tribunal que ha exhibido documentos adicionales a Perenco en el día de la fecha". [Traducción del Tribunal]

en el Informe Consolidado del Perito Independiente indican que exhibió 2500 documentos de respuesta a Perenco[933].

782. Si bien Perenco se quejó de la medida en la cual Ecuador dio cumplimiento a la orden del Tribunal[934], no hizo demasiado hincapié en dichas quejas[935]. Ambas Partes han estado representadas en el presente arbitraje por abogados capaces y el Tribunal no está dispuesto a concluir que Ecuador no exhibió los documentos relevantes de Petroamazonas inherentes a los incidentes de derrames en las áreas objeto de estudio del Perito Independiente. Procede sobre la base de que Ecuador cumplió debidamente con los términos de la Resolución Procesal No. 17.

783. El Tribunal ha tomado nota, una vez más, del hecho de que durante la Audiencia Pericial Perenco no atrajo la atención del Perito Independiente hacia varios informes de los derrames de Petroamazonas[936]. Ello sugiere que las pruebas documentales exhibidas a Perenco no brindaban tanto respaldo a su alegación de que un valor significativo de contaminación identificado por el Sr. MacDonald debería ser atribuido a las actividades de Petroamazonas como Perenco había esperado[937].

784. Pareciera que hay buenos motivos para ello: en virtud de la prueba documental exhibida por Ecuador, se supone que fueron informados 35 derrames y emisiones que tuvieron lugar

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933 Informe Pericial Consolidado, pág. 250.

934 Véase carta de Perenco de 5 de febrero de 2019 citada *supra*. Además, el escrito de Perenco de 22 de febrero de 2019 disponía en el párr. 12 lo siguiente: "La exhibición de documentos de Ecuador de once horas de duración deja la imagen de que es demasiado incompleta para describir adecuadamente el valor de los impactos ambientales durante los diez años de operación de [Petroamazonas]". [Traducción del Tribunal]

935 Véase Alegato de Clausura de Perenco, págs. 81 y 84 relativas a su alegación de que Ecuador no divulgó ciertos incidentes ambientales y la declaración de Ecuador de que no hubo operación en Lobo 4 luego del año 2009.

936 El ejemplo principal es un derrame de Petroamazonas en Coca 6. Véase Tr. (1) (MacDonald) (11 de marzo de 2019) 173-175, contrainterrogatorio del Sr. MacDonald por parte del Sr. Friedman respecto del derrame en Coca 6.

937 Si bien el abogado arguyó en favor del factor de descuento respecto de los costos de remediación del suelo y aguas subterráneas fundado en la duración relativa de Petroamazonas y Perenco en la operación de los Bloques, hizo hincapié en pocas pruebas obtenidas de los informes de derrames y otros documentos exhibidos ante él para demostrar que cualquier contaminación que el Sr. MacDonald había estimado era atribuible a Petroamazonas. Tr. (1) (MacDonald) (11 de marzo de 2019) 173-176 y 222-223; Tr. (2) 460.

en las áreas pertinentes a partir de julio de 2009[938]. Debían ser principalmente pequeñas cantidades de derrames o emisiones que fueron remediadas u ocurrieron en sistemas secundarios de contención. Resulta más importante para la determinación del Tribunal que 2*6 de los 35 derrames evidentemente tuvieron lugar fuera de las áreas identificadas por el Sr. MacDonald como contaminadas, o en sitios en los cuales su plan de remediación conceptual analiza solamente piscinas de lodo que fueron construidas y utilizadas por Perenco*. Asimismo, cinco de los derrames tuvieron lugar en sitios en los cuales el plan de remediación analiza concentraciones elevadas de metales (por ejemplo, el bario). Además, no hay mención alguna en el Informe del Perito Independiente sobre derrames recientes registrados en los sitios en los que Ramboll realizó sus ensayos. Esto llevó a Ecuador a afirmar que, si bien el Perito Independiente observó la presencia de crudo en áreas pantanosas en algunos sitios (por ejemplo, Coca 2 y Payamino 2/8), no observó condiciones que indicaran emisiones recientes[939].

785. En síntesis, en relación con la que podría llamarse la ´cuestión temporal de Petroamazonas´, y dada la totalidad de las circunstancias (incluso la obligación restringida del Perito Independiente, sus consultas y las de su equipo con los peritos y abogados de las Partes durante las actividades de muestreo, y los informes de derrames y otros documentos exhibidos por Ecuador), el Tribunal ha concluido que el uso de un factor de descuento generalmente aplicable fundado *exclusivamente* en la división del período de tiempo en el que Perenco y Petroamazonas operaron los Bloques sería, por sí mismo, un método muy crudo de atribución de la responsabilidad e insuficientemente vinculado con las pruebas obrantes en el expediente. El Tribunal concluyó que se requería un examen más detenido de los sitios en los que se determinó presencia de contaminación antes de utilizar un factor

938 E-460.

939 Informe Pericial Consolidado, pág. 10, punto 7: “Las áreas evaluadas por MacDonald eran las mismas que IEMS había evaluado a partir del año 2010. Además, no hay ninguna contaminación reciente por parte del operador actual que haya sido advertida por alguno de los actores que han inspeccionado los Bloques desde el año 2010 (incluso el Consorcio de peritos y representantes) ni tampoco informada por el Sr. MacDonald durante su visita en los meses de octubre y noviembre de 2016 ni durante su trabajo de campo de 4 meses en otoño del año 2017”. [Traducción del Tribunal]

de descuento fundado, por ejemplo, en el período de gestión respectivo de ambos operadores.

(c) Contaminación causada por operadores anteriores

786. La segunda cuestión temporal, concretamente, la posibilidad de que se responsabilice a Perenco por la contaminación causada por operadores anteriores constituye, a juicio del Tribunal, una cuestión mucho más significativa y compleja.

787. La resolución de esta cuestión se ve complicada por el hecho de que la prueba documental de Perenco de su propia evaluación de la condición de los Bloques en el año 2002 era inexistente. El Sr. Wilfrido Saltos declaró que se llevó a cabo una evaluación de los Bloques cuando Perenco adquirió sus participaciones, sin embargo, cuando le fue solicitada, Perenco no pudo presentar ninguna auditoría escrita de los Bloques elaborada por o para Perenco en aras de establecer su condición en el momento de su adquisición[940]. Lo máximo que pudo demostrar fue que obtuvo una declaración y garantía del vendedor, Kerr-McGee, de que este último había cumplido con todas las leyes ambientales ecuatorianas, a excepción de ciertas cuestiones enumeradas en dos anexos de los contratos[941]. Uno de los anexos, el Anexo 3.9(a), fue admitido en el expediente en una etapa más temprana del presente procedimiento[942].

788. El Tribunal consideró que el Anexo 3.9(a) resultaba de ayuda al efecto de establecer la condición ambiental de los Bloques en el año 2002. Observó lo siguiente:

> A los fines de la presente Decisión, si bien el Tribunal considera que el Anexo 3.9(a) representa una evaluación contemporánea útil de los Bloques, no puede calificarse como un análisis definitivo y exhaustivo de su condición ambiental. Es posible que haya existido alguna contaminación de la que Kerr-McGee no estaba al tanto o que no haya revelado. No existe ningún indicio de que Perenco haya impugnado la lista de incumplimientos suministrada por Kerr-McGee informándole acerca de otra contaminación y otros problemas regulatorios que no le habían sido comunicados en el Anexo 3.9(a) ni tampoco existen pruebas de que

940 Decisión Provisional, párrs. 386-388.

941 *Ibid.*, párrs. 392 y 393.

942 *Ibid.*, párr. 394.

> Perenco se haya quejado frente a Kerr McGee por no haber hecho una divulgación precisa. Así, el Anexo 3.9 (a) ofrece un punto de partida para distinguir entre toda contaminación que pueda haber ocurrido con anterioridad a la adquisición por parte de Perenco de sus participaciones y toda contaminación que haya ocurrido con posterioridad a tal adquisición[943]. [Énfasis agregado]

789. Por lo tanto, el Anexo 3.9 (a) resultó un elemento de prueba útil, un punto de partida, aunque difícilmente determinante de la cuestión de la condición ambiental de los Bloques.

790. El otro anexo, el Anexo 3.9(b), que enumeraba todos los pozos en el Área de los Contratos con una descripción de su estado, no fue incluido en la versión redactada de Perenco del Contrato de Compraventa presentado anteriormente en el procedimiento de reconvención. El Tribunal consideró que este debería ser presentado en la siguiente etapa del presente procedimiento ya que puede aportar algo de claridad sobre la condición de los Bloques en el año 2002[944]. El Anexo 3.9(b) fue debidamente presentado por Perenco, pero solamente enumera el estado de cada uno de los pozos en los Bloques en el momento de la adquisición y no proporciona ninguna perspectiva adicional en lo que respecta a su condición ambiental[945].

791. El Tribunal consideró asimismo que en el supuesto de que las Partes no pudieran transigir esta parte del caso sobre la base de las conclusiones de la Decisión Provisional sobre la Reconvención y que el Tribunal debiera proceder a la presente etapa del procedimiento, resultará útil examinar la carta DINAPA-CSA-1602001-20001697 del mes de septiembre de 2001, si es que puede ubicarse una copia, ya que contiene la opinión de la autoridad de aquello que era necesario hacer en ese momento para que el Operador cumpliera con sus obligaciones legales[946]. Esto fue presentado debidamente por Ecuador como Anexo E-445. Lamentablemente, no redundó en un avance en las cuestiones. Una comparación de la carta

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943 *Ibid.*, párr. 398.

944 *Ibid.*, párr. 399.

945 CE-CC-432, presentado con la carta de Perenco de fecha 25 de enero de 2019. El anexo enumeraba alrededor de 50 pozos productivos, 10 pozos cerrados, tres pozos sellados y abandonados (“P & A”, por sus siglas en inglés), un pozo “abandonado temporalmente” (“TA”, por sus siglas en inglés) y tres pozos de disposición de agua en el Bloque 7; y dos pozos sellados y abandonados, siete pozos abandonados temporalmente, y un pozo de prueba en el Bloque 21.

946 Decisión Provisional, párr. 397.

de inspección de DINAPA de 4 de septiembre de 2001 con el Anexo 3.9(a) demuestra que el Anexo esencialmente la reproduce.

792. El Tribunal recuerda su anterior análisis de la prueba en cuanto a las condiciones ambientales de los Bloques en el momento de la adquisición por parte de Perenco de sus participaciones en los Contratos de Reparto de Producción:

> Tanto en los escritos de las Partes como en los informes de sus peritos, surgió un gran debate acerca de si determinados casos de contaminación eran atribuibles a las acciones de Perenco o a otras partes que llevaron a cabo operaciones en las áreas que se convirtieron en los Bloques 7 y 21 antes de que Perenco entrara en escena. Considerando la conclusión del Tribunal de que conforme a un régimen basado en la culpabilidad Perenco puede eludir la responsabilidad si demuestra que un caso particular de contaminación es consecuencia de los actos de otra persona, ello necesariamente exige que el Tribunal considere la condición ambiental de los dos Bloques cuando Perenco adquirió sus participaciones de parte de Kerr-McGee[947].

793. La Decisión Provisional analizó pruebas de contaminación anterior que fueron presentadas por Perenco[948]. Perenco regresó a algunas de estas pruebas durante sus alegatos de clausura en la última etapa del procedimiento que nos ocupa[949]. Hizo asimismo un comentario importante de que el derecho ambiental ecuatoriano se ha vuelto más riguroso con el transcurso del tiempo[950].

794. La perforación en el yacimiento unificado Coca-Payamino se remonta al año 1971, con sucesivos operadores: CEPE y BP, *Petroproducción*, Oryx, con posterioridad nuevamente *Petroproducción*, y ulteriormente Kerr-McGee, todos ellos precedieron el ingreso de

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947 *Ibid.*, párr. 380.

948 *Ibid.*, párrs. 405 y notas al pie 926, 927 y 934.

949 Presentación de Cierre de Perenco, págs. 61-67.

950 Tr. (2) (MacDonald) (12 de marzo de 2019) 513: 17-514:3:"Se la está confrontando con responsabilidades de antigua data, en su mayoría, cosas que tuvieron lugar hace mucho tiempo en virtud de un régimen regulatorio diferente. Incluso podría no haberse tratado de violaciones de las regulaciones ambientales en ese momento, pero, sin embargo, ocurrieron ante la mirada del Estado, o en un momento en el cual las operaciones eran en beneficio del Estado, y Perenco no desempeñaba rol alguno. Perenco ni siquiera se encontraba en la escena". [Traducción del Tribunal]

Perenco en ese yacimiento alrededor de 30 años después de que CEPE y BP llevaran a cabo perforaciones exploratorias por primera vez[951].

795. En el Bloque 7, CEPE y BP, Kerr-McGee y *Petroproducción*, y ulteriormente Kerr-McGee, todos operaron con anterioridad a Perenco. Como es de esperarse, en el yacimiento unificado Coca-Payamino y en el Bloque 7 (con excepción de Oso) fueron perforados más pozos por los operadores precedentes que por la propia Perenco[952].

796. En el Bloque 21, que no cuenta con un historial tan vasto como aquel del Bloque 7[953] – la propia Perenco caracterizó al Bloque 21 como un "proyecto de desarrollo totalmente nuevo" porque no había "ninguna infraestructura en pie para la producción de petróleo"[954] – Kerr-McGee precedió a Perenco[955]. En efecto, de los 77 pozos enumerados en el Anexo 3.9(b) del Contrato de Compraventa Kerr-McGee, solamente nueve se encontraban emplazados en el Bloque 21 y ninguno de ellos se encontraba operativo en el momento de la adquisición[956]. En lo que respecta a los pozos en el yacimiento Yuralpa en el Bloque 21,

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951 GSI elaboró una Tabla en el Apéndice B.4 de su primer informe pericial que enumeraba sitio por sitio, la perforación de determinados pozos (Payamino 02-08, Mono CPF/Mono 1-5/1W, Payamino 1, Gacela 01-08, Coca 18-19, Coca 01, Coca 04, Coca 06, Coca 08, Coca CPF, Gacela 02, Jaguar 02, Jaguar 07-08, Mono Sur / Mono 6-9, 11, Payamino 04, y Yuralpa Pad A) por parte de las predecesoras de Perenco y los efectos de dichas perforaciones.

952 Alegato de Clausura de Perenco, pág. 4. GSI ER I, párr. 160: "De los 95 pozos completados en las áreas del CPUF y del Bloque 7 para el año 2009, 68 (71%) se perforaron con anterioridad al año 2002: en consecuencia, los impactos en el suelo relacionados con las actividades de perforación en esos sitios anteriores al año 2002 estarían asociados a los operadores anteriores, no al Consorcio. En efecto, la información disponible indica que algunos pozos perforados con anterioridad al año 1990 se completaron sin la utilización de piscinas de lodo/recortes, lo que redundó en descargas de excesos de lodo y recortes de perforación en el área circundante". [Traducción del Tribunal]

953 Al parecer, Yuralpa 1 fue perforado en el año 1972 por Texaco. Véase el Apéndice B.4 del GSI ER I. Los siguientes pozos que se habrían de perforar fueron Yuralpa Centro 1 (octubre de 1997), Dayuno 1 (setiembre-octubre de 1987), Sumino (un pozo de inyección) (mayo de 1998), Yuralpa Centro 2 (abril 1999), Nemoca (diciembre de 1999), y Waponi y Ocatoe (ambos en el mes de agosto de 2000).

954 En su Memorial Revisado de fecha 5 de agosto de 2011, Perenco aseveró en el párr. 42: "El Bloque 21 es un terreno con una superficie de 155.000 hectáreas a varios cientos de kilómetros al este de Quito. LC WS ¶ 4. Cuando Perenco adquirió su participación en Ecuador, el Bloque 21 era literalmente un proyecto de desarrollo totalmente nuevo: no había ninguna infraestructura en pie para la producción de petróleo".

955 Alegato de Clausura de Perenco, pág. 3.

956 CE-CC-432. Los pozos son Yuralpa-1, Dayuno-1, Yuralpa C-1, Chonta-1, Sumino-1, Yuralpa C-2, Nemoca-1, Waponi-1, y Ocatoe-1. Los dos primeros fueron 'sellados y abandonados' y todos los demás fueron 'abandonados temporalmente'. [Traducción del Tribunal]

Perenco perforó la mayor parte de esos pozos[957] hasta que Petroamazonas inició las operaciones[958].

797. En apariencia se informó que habían tenido lugar alrededor de 84 derrames y emisiones antes del mes de septiembre de 2002, de los cuales, cuatro, no se encontraban específicamente ligados a un sitio sino solamente al Bloque 7 o a un yacimiento de pozos (por ejemplo, Coca, Mono-Jaguar, Payamino)[959]. GSI utilizó también un número un poco inferior; que incluyó en su primer informe pericial en el año 2012 como Apéndice B.3, que identificó 55 derrames y emisiones "pre-Perenco"[960]. En el cuadro sinóptico se incluyó una breve descripción de la naturaleza y calidad de la emisión y cualquier producto recuperado. En 11 de estos sitios, las emisiones reportadas fueron más de 20 barriles, y algunas de estas emisiones resultaron supuestamente significativas (concretamente, 150 barriles en Coca 8 y 110 barriles en Gacela 6). Sin embargo, GSI no proporcionó detalles acerca de, entre otras cosas, dónde tuvieron lugar las emisiones dentro de un sitio dado, qué medios se vieron afectados (por ejemplo, suelo, superficie, agua), cómo se trataron los medios afectados (si es que acaso lo fueron), ni aportó los documentos de respaldo que utilizó en aras de crear su cuadro sinóptico.

798. Dicho esto, el Tribunal acepta la esencia de la posición de Perenco de que debía existir contaminación preexistente debido a que hay pruebas que respaldan las siguientes

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957 Véase el Apéndice B.4 del GSI ER I, págs. 4 y 5.

958 Perenco observó, en los párrs. 45-47 de su Memorial Revisado, de fecha 5 de agosto de 2011, que: El Bloque 21 era literalmente un "proyecto de desarrollo totalmente nuevo" porque no había "ninguna infraestructura en pie para la producción de petróleo". Perenco afirmó lo siguiente: "a fines del primer trimestre del 2004 el Consorcio ya había elevado la producción de cero a casi22.000 barriles al día". Sin embargo, debido a un "un percance técnico [que] provocó una caída en la producción de los pozos más abundantes del Bloque 21, los que para entonces habían estado produciendo aproximadamente 12.000 barriles al día... Perenco se vio obligado a perforar pozos adicionales que no habían estado contemplados originalmente, como asimismo a comprometer capitales adicionales a fin de reponer la producción". "En consecuencia, para fines del primer trimestre del 2006 –cuando Ecuador promulgó la Ley 42– el Consorcio ya había invertido $197 millones en el Bloque 21… Había perforado más de 25 pozos productivos, en comparación con los 12 contemplados originalmente, y estaba produciendo casi 16.000 barriles por día".

959 Véase Apéndice B de GSI ER I y el Informe Grizzle de 1998. Véase también cuadro sinóptico de Perenco Ecuador a DINAPA, Informe Técnico – Caracterización Ambiental de la Plataforma Payamino 2-8 ("Informe Walsh"), y Registros de derrames de Petroamazonas posteriores a julio de 2009 (aportado por Ecuador como E-460 presentado con sus comentarios sobre el Informe del Perito Independiente el 22 de febrero de 2019).

960 GSI ER I, Apéndice B.3. [Traducción del Tribunal]

conclusiones: (i) que el marco jurídico ecuatoriano que regía los aspectos ambientales de las operaciones hidrocarburíferas era menos riguroso que el RAOHE y el TULAS (el primero promulgado en el año 1995 y posteriormente modificado en el año 2001 y el último promulgado en el año 2003[961]); y (ii) que algunas prácticas de los operadores se llevaron a cabo con arreglo a ese estándar menos riguroso en las décadas de 1980 y 1990.

799. Por ejemplo, un informe interno de evaluación ambiental sobre el yacimiento Coca-Payamino elaborado para Oryx en el año 1994 por Patrick Grizzle y Nancy Sahr (cuando Oryx se hizo cargo de las operaciones en ese yacimiento), resultó preocupante. Además de identificar diversas prácticas que necesitaban mejoras, el informe observó lo siguiente:

> En la actualidad, no existe ningún sistema de informes o procedimiento escrito dentro de *PetroProducción* [sic] para la denuncia de contaminación ambiental o incidentes de derrames. Debería implementarse un sistema de denuncia de incidentes lo más pronto posible[962]. [Énfasis agregado].

800. El informe de 1994 desafortunadamente no contenía resultados de muestras y análisis. A partir de una inspección visual los autores creyeron que el nivel de contaminación era "mínimo", aunque agregaron lo siguiente: "como el presente estudio no incluyó muestras y análisis, los niveles de contaminación no pueden confirmarse"[963]. A juicio del Tribunal, es más probable que improbable que *Petroproducción* y otros operadores en ese momento ocasionaran daños, pero existe poca información sólida en cuanto al alcance de la contaminación que podría haber resultado de la laxitud en las prácticas ambientales en ese entonces. Tal como observara anteriormente el Tribunal cuando trató la cuestión en la Decisión Provisional, las inspecciones visuales son de importancia, pero en sí mismas y

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961 Decisión Provisional, págs. iii-iv.

962 *Ibid.*, párr. 383, que cita el E-261, Evaluación Ambiental de Oryx Ecuador Energy Company, Campo Coca-Payamino de mayo de 1994, pág. 6.

963 *Ibid.*, párr. 382, que cita el E-261, Evaluación Ambiental de Oryx Ecuador Energy Company, Campo Coca-Payamino de mayo de 1994, pág. 4.

por sí mismas no resultan suficientes para identificar y determinar el alcance de la contaminación[964].

801. Hay algunos indicios probatorios de que al menos se remediaron algunos de los derrames identificados en el año 1994. La Auditoría Ambiental Interna de las Operaciones de Oryx Ecuador del mes de marzo de 1996, también realizada por el Sr. Grizzle y la Sra. Sahr, que dio seguimiento a una auditoría del año 1995, observó lo siguiente:

> Se observaron diversas cuestiones ambientales durante la auditoría. Muchas de ellas se observaron en la Auditoría de 1995 y algunas se han corregido o se han corregido parcialmente[965]. [Énfasis agregado]

802. El informe de Grizzle de 1998, encomendado en un momento en el que Oryx se encontraba en negociaciones para hacerse cargo del yacimiento Coca-Payamino, siguió el mismo formato y contenido general que los informes de los años anteriores. El informe proporcionaba esencialmente una captura fotográfica de las condiciones en 27 sitios. En general muestra que, además de un único derrame en Coca 6, los hechos históricos pueden describirse como derrames o emisiones de pequeñas cantidades que parecieran resultar de

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964 *Ibid.*, párr. 409: "…El Tribunal concuerda con Ecuador en que el crecimiento rápido de la vegetación puede nublar una inspección visual de contaminantes y ello no significa que éstos desaparecen a los fines de la remediación. Por lo tanto, si bien tal como resaltó GSI, las inspecciones visuales son una parte importante de toda evaluación integral, difícilmente sean adecuadas para la tarea de determinar el alcance de la contaminación y el Tribunal no está satisfecho con basarse en la evaluación visual de un perito". La propia Perenco señaló esto, en el párr. 266 de su Dúplica sobre las Reconvenciones, cuando emitió su opinión acerca de las diversas auditorías realizadas cuando Oryx era el operador, específicamente en relación con la contaminación en el pantano Jungal/ Payamino 2-8: "Los comentarios en auditorías posteriores de que el área afectada por un derrame ulterior al año 1991 por parte de Petroproducción 'ha sido revegetada y se encuentra en buen estado' no establecería que ello se debió a la remediación, ya sea del derrame del año 1991 o del incidente del año 1987. En la actualidad, el pantano Jungal se encuentra todavía densamente cubierto de vegetación, a simple vista parece estar en buen estado, y no presenta signos evidentes de contaminación, sin embargo, tanto IEMS como GSI han confirmado excesos de TPH y bario en ese emplazamiento" [Traducción del Tribunal]. También hay indicios de petróleo crudo sobre la ladera que conduce al pantano y dentro del propio pantano.

965 E-262, Evaluación Ambiental de Oryx Ecuador Energy Company, Campo Coca-Payamino de mayo de 1994, pág. 4. El informe del año 1998 observó otra mejora: "Se observaron diversas cuestiones ambientales en general durante la auditoría. Muchas de ellas se observaron en auditorías anteriores y la mayoría se ha corregido o se ha corregido parcialmente. En general, se observaron mejores prácticas ambientales en la auditoría del año 1998 cuando se la compara con aquella de 1997" [Traducción del Tribunal]. E-264, Evaluación Ambiental de Oryx Ecuador Energy Company, Campo Coca-Payamino, de fecha 22-23 de junio de 1998, pág. 1. [Traducción del Tribunal]

prácticas deficientes de operación y mantenimiento (por ejemplo, válvulas y bridas permeables, sistemas secundarios de contención dañados, separadores de petróleo/agua saturados, sobrecargas en los tanques diésel). La cantidad más significativa de derrames y aquellos de mayor envergadura se observaron dentro los CPF (Coca CPF y Payamino CPF) y no en las plataformas[966]. En definitiva, el informe de Grizzle del año 1998 no pretendió identificar emisiones específicas, estimar cantidades, ni asegurar en qué momento tuvieron lugar las emisiones.

803. La Decisión Provisional sobre la Reconvención observó lo siguiente:

> … cuando Oryx se encontraba en medio de las negociaciones para reanudar la operación del Campo Coca-Payamino (evidentemente había sido operado por *Petroproducción* durante unos dieciocho meses), un tal Patrick Grizzle (que parece haber sido un empleado de Oryx) llevó a cabo una inspección entre el 12 y el 14 de enero de 1998. La opinión del Sr. Grizzle fue que las condiciones ambientales se habían deteriorado en el período durante el cual el campo estaba siendo operado por Petroproducción y criticó su operación. Oryx había operado el campo desde 1995 hasta 1997 y el Sr. Grizzle registró lo que él percibió como un retroceso respecto de muchas de las mejores prácticas de Oryx. Parece haber llegado a esta conclusión basándose completamente en inspecciones visuales (se adjuntan muchas fotografías al informe). Una vez más, según el informe, no se tomaron muestras de suelos, aguas superficiales o aguas subterráneas[967]. [Énfasis agregado]

804. No existe controversia entre las Partes en cuanto a que en el período previo a la suspensión de las operaciones por parte de Perenco en el mes de julio de 2009, la mayor parte de los pozos de producción en el Bloque 7 y en el yacimiento Coca-Payamino (con exclusión de Oso) se perforaron antes de que Perenco arribara a Ecuador. En su Presentación de Cierre, Perenco enumeró 57 pozos que eran anteriores a su operación del Bloque 21. (Por el contrario, enumeró 15 pozos en ese Bloque por los cuales pareció haber asumido la responsabilidad[968]).

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966 El propio Tribunal observó en su Decisión Provisional, en el párr. 405, que las pruebas en el expediente indicaban "algunos problemas con el Campo Coca-Payamino y la plataforma Oso 1" que eran anteriores a la operación por parte de Perenco.

967 *Ibid.*, párr. 385 [referencias en las notas al pie omitidas].

968 Presentación de Cierre de Perenco, pág. 4.

805. Dados los informes Grizzle-Sahr, en particular, los comentarios respecto del retroceso de *Petroproducción* (citado en el párrafo 385 de la Decisión Provisional sobre la Reconvención recién señalado) y muchos otros elementos probatorios pertenecientes a pozos que fueron perforados con anterioridad a la operación de Perenco, el Tribunal es renuente a fundarse en los anexos del Contrato de Compraventa como declaración exhaustiva y definitiva de la condición ambiental de los Bloques. Sin embargo, el Tribunal no puede sino observar que Perenco debería haber inspeccionado y documentado mejor las condiciones del Bloque antes de suscribir el CCV y sus anexos. Se debe a su negligencia que los anexos no proporcionen una declaración exhaustiva y definitiva de la condición de los Bloques en el año 2002.

806. El informe Grizzle-Sahr de 1998 ilustra perfectamente el desafío que enfrenta el Tribunal al tener que distinguir la contaminación en los Bloques que sin duda resulta jurídicamente irrelevante de aquella que podría resultar jurídicamente relevante para el presente ejercicio. El informe de 1998 observó que había existido una emisión en Coca 6. Pero esa emisión tuvo lugar en un área que se encuentra a bastante distancia del área de Coca 6 incluida en el plan conceptual de remediación del Sr. MacDonald y, por lo tanto, no surge cuestión alguna en cuanto a la responsabilidad de Perenco[969]. No obstante, el informe Grizzle identificó también tres sitios en donde las emisiones denunciadas podrían haber contribuido a la contaminación en áreas que el Perito Independiente identificó que necesitaban remediación. Dadas la inspecciones anuales y las recomendaciones que se hicieran en ellas, y el hecho de que Grizzle y Sahr observaran que se habían hecho algunos avances para hacer frente a las cuestiones identificadas en informes anteriores, es posible que Kerr-McGee adoptara medidas para remediar estos incidentes antes de vender sus participaciones en los Bloques a Perenco, pero no existen pruebas suficientes en el expediente para que el Tribunal esté convencido en lo que respecta a este tema. Por lo tanto, el Tribunal procede sobre la base de que parte de la contaminación en los siguientes tres sitios anteceden a la operación de Perenco:

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969 CE-CC-21; Apéndice K del GSI ER I; Presentación de Cierre de Ecuador, pág. 2.

> – Coca 2/CPF - Emisiones de petróleo del separador API que descargaron en la zona pantanosa al sudeste de la instalación.
>
> – Payamino 1/CPF - La presencia de piscinas históricas en la instalación con varios miles de barriles de crudo al oeste de la CPF, que podrían haber saturado hacia el norte, en dirección a la zona de captación y la zona pantanosa al norte/noroeste de la instalación.
>
> – Payamino 23 – Se observaron derrames detrás del sistema Power Oil y en la entrada norte y aun existía una piscina de reserva abierta al sur de la instalación de Power Oil[970].

807. Ello muestra el potencial para la estratificación de la contaminación por parte de los distintos operadores. Esta situación milita en favor de atribuir una responsabilidad compartida con base en la duración de la tenencia o con base en algún otro factor de ponderación.

808. En última instancia, el Tribunal está convencido de que la prueba documental contemporánea indica que existió contaminación causada por los operadores en los Bloques en las décadas que precedieron al período de operación de Perenco. Las inspecciones visuales registradas en diversos informes citados recientemente identificaron una variedad de defectos y en algunas instancias Grizzle y Sahr asignaron calificaciones de "mantenimiento deficiente" a diversos pozos[971]. Es suficiente que el Tribunal tenga

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970 En lo que respecta a los primeros dos de estos sitios, el Tribunal considera que la mayor parte de la contaminación hallada por el Perito fue causada por las predecesoras de Perenco.

971 Tras una auditoría del mes de mayo de 1994, Grizzle y Sahr arribaron a la conclusión de que los siguientes sitios tuvieron un mantenimiento deficiente que "se infiere de procedimientos de operación inferiores reflejados por restos evidentes, mantenimiento mínimo o falta de mantenimiento de equipos y edificios, numerosos derrames operativos, y vegetación inadecuada y control de la erosión" [Traducción del Tribunal] (pág. 12) (se enumeran aquí solo aquellos sitios delineados por el Sr. MacDonald): Payamino 4, Payamino 10, Payamino 13, Payamino 15, Payamino 16, Payamino y Coca CPF (aunque el informe afirma que el nivel de contaminación era menor, véase pág. 44), y Coca 8. Véase E-261. [Traducción del Tribunal]

Tras una inspección llevada a cabo entre los días 11 y 14 de marzo de 1996, Grizzle y Sahr observaron que el mantenimiento deficiente en Payamino 10 se había corregido (pág. 9) mientras que esto aun se mantenía en Payamino 16 (pág. 11). Su informe observaba asimismo que el sistema de alcantarillado de Jaguar 7 resultaba "extremadamente deficiente" [Traducción del Tribunal] y que existían prácticas de almacenamiento deficientes (pág. 6). En términos más generales, el informe determinó que debía reconsiderarse la práctica de descarga de aguas residuales en un arroyo, no solo para Mono 3, sino en su conjunto, en aras de proteger la salud de las personas en el emplazamiento y aquellas que habitaban junto a los arroyos (pág. 6). Véase E-262.

conocimiento de la existencia de operaciones de perforación generalizadas en el yacimiento Coca-Payamino y en otras partes del Bloque 7 y de que se perforaron unos pocos pozos en el Bloque 21 con anterioridad al arribo de Perenco y de que existe prueba documental contemporánea que demuestra que en ese momento había una laxitud relativa a la hora de llevar a cabo operaciones de perforación y otras actividades hidrocarburíferas de manera que se proteja al medioambiente.

809. Perenco ha dirigido asimismo la atención del Tribunal a otros indicios de derrames anteriores a su asunción de la operación de los dos Bloques. El Tribunal acepta la afirmación de Perenco de que ciertos contaminantes, en particular, el bario (con o sin otros metales (concretamente, cadmio, cromo, plomo, níquel y/o vanadio)), debieran considerarse asociados a la instalación de los pozos de producción. Dada la prueba documental que da cuenta de que una parte sustancial de la perforación de esos pozos tuvo lugar con anterioridad al año 2002, se deduce que Perenco ha demostrado, con base en una preponderancia de prueba, que los excedentes de bario en esos sitios son el resultado de acciones de sus predecesoras. Dado el emplazamiento de esos pozos, conjuntamente con las piscinas de lodo construidas y utilizadas por las predecesoras de Perenco, el Tribunal ha podido excluir la responsabilidad en todo o en parte, por diferentes partes de los diversos sitios sometidos a estudio.

810. El Tribunal reconoce que en su intento de "desentrañar el dilema de la contaminación" [Traducción del Tribunal], hace frente a hechos conocidos y desconocidos[972]. A pesar del trabajo llevado a cabo por los peritos de las Partes y complementado por el Perito Independiente del Tribunal, este ejercicio no es uno de certeza científica. No obstante, tal

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La copia que se proporcionó al Tribunal del informe realizado entre los días 6 y 9 de junio de 1997 por Grizzle y Sahr parece haber resultado acotada y no trata sitios específicos. Véase E-263.

Con posterioridad a la auditoría ambiental interna de los días 22 y 23 de junio de 1998, Grizzle y Sahr no hicieron referencia a condiciones de mantenimiento, sino que observaron diversas cuestiones y medidas necesarias en lo que respecta a diversos sitios. En general, se observó que los siguientes sitios demandaban o aun demandaban remediación (en su mayoría afectaban el suelo): Instalación de Lobo 1, Jaguar 2, Jaguar 3, Jaguar 7, Mono 1, Mono 5, Gacela 1/8, Gacela 2, Gacela 4, Gacela 5, Gacela CPF (una vez más, se han presentado aquí solo aquellos sitios delineados por el Sr. MacDonald).

[972] Tal como dejara en claro la Presentación Directa del Perito, en la Diapositiva 18, pueden existir lagunas de información incluso después de muchos eventos de muestreo y, por lo tanto, habitualmente se aplican inferencias para complementar los resultados analíticos.

como se observara en el párrafo 69 *supra*, la estimación de daños no es una ciencia y un juzgado o tribunal debe trabajar con la prueba ante sí.

811. En aras de la claridad: antes de utilizar un sistema de ponderación con base en el tiempo con respecto a un sitio particular, se separaron las áreas dentro del sitio que pudieran designarse claramente como "no Perenco" o "Perenco" y se las colocó en el "ámbito" de responsabilidad correspondiente [Traducción del Tribunal]. Asimismo, cuando se pudieron utilizar otros criterios, estos se aplicaron en lugar del enfoque de tiempo ponderado. Pero en ocasiones ha resultado necesario adjudicar la responsabilidad entre operadores sucesivos. En lo que respecta a los operadores anteriores, el momento de perforación del primer pozo en un sitio específico se emplea como punto de partida y el mes de julio de 2009, cuando Perenco puso fin a sus operaciones en los Bloques, se emplea como fecha final (con excepción de los sitios en los que resulta aplicable la 'cuestión temporal de Petroamazonas')[973]. – Esto tiende a un sesgo en favor de Perenco, y por lo tanto se trata de un estimado conservador de su responsabilidad, ya que no considera la posibilidad de fechas ulteriores de emisión de contaminantes y el hecho de que algunos yacimientos se perforaron aunque no se explotaron de manera excesiva hasta el arribo de Perenco, (concretamente, Oso y Yuralpa)[974]. En lo que se refiere a cualquier adjudicación entre Perenco y Petroamazonas, en la medida limitada en que se lo utiliza (por los motivos esgrimidos anteriormente) el sistema ponderado en el tiempo utiliza el mes de julio de 2019 como fecha final. Esto solo resulta relevante para unos pocos sitios para el agua subterránea

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973 Véase párr. [785] *supra*.

974 Informe Pericial Consolidado, págs. 24-25: "Las primeras actividades de exploración de petróleo dentro del Bloque 7 y el CPUF supuestamente tuvieron lugar a comienzos de la década de 1970, cuando Texaco perforó pozos de exploración en las plataformas Coca 1, Cóndor 1, y Zorro 1. British Petroleum (BP) también construyó un pozo de exploración en Oso 1 en el año 1970. Las actividades de extracción de petróleo no parecen haber ocurrido hasta aproximadamente el mes de diciembre de 1985 cuando BP comenzó a desarrollar un área con arreglo a un contrato de prestación de servicios…". En lo que respecta al Bloque 21, "Texaco comenzó las actividades de exploración de petróleo en el Bloque 21 durante el comienzo de la década de 1970 en la plataforma Yuralpa 1. No se desarrollaron otras actividades dentro del Bloque hasta el mes de marzo de 1995, cuando Oryx llevó a cabo estudios preliminares adicionales de impacto ambiental y sísmico. Cuando Perenco comenzó a operar en el Bloque 21 en el año 2002, el Bloque comprendía un número reducido de pozos (aproximadamente nueve) y plantas centrales de procesamiento ("CPF", por sus siglas en inglés). En el momento de adquisición de las operaciones en el mes de julio de 2009, las operaciones dentro del Bloque 21 habían aumentado de manera sustancial". [Traducción del Tribunal]

(Coca 2/CPF, Gacela 1/CPF y Payamino 1/CPF) y, por lo tanto, supone mucha menos importancia que el sistema utilizado para Perenco y los operadores anteriores.

3. ¿Actuó el Perito Independiente dentro del marco de su mandato?

812. Procediendo al abordaje de la segunda serie de cuestiones, virtualmente todas ellas se encuentran interconectadas con el ejercicio del juicio y conocimientos técnicos. No obstante, el Tribunal considera que deberían abordarse los siguientes interrogantes pertenecientes al mandato del Perito Independiente.

813. Específicamente:

> ¿El Perito Independiente se ciñó a las restricciones del Tribunal en cuanto al muestreo del sitio?
>
> ¿El Perito Independiente siguió la instrucciones del Tribunal en lo que respecta a los criterios de uso del suelo?
>
> ¿El Perito Independiente se extralimitó en su mandato con respecto a las piscinas de lodo al resolver la aplicación de la Tabla 7(a) del RAOHE a todas las piscinas de lodo?
>
> ¿El Perito Independiente se extralimitó en su mandato en lo que respecta al monitoreo de aguas subterráneas al resolver la aplicación del TULAS a muestras de agua subterránea tomadas de pozos instalados en sitios en donde el contenido de arcilla superaba el 25%?
>
> ¿El Perito Independiente se ciñó a las instrucciones del Tribunal de que al momento de estimar los costos de cualquier remediación de la que Perenco fuere responsable, el Perito debería regirse por los costos ecuatorianos[975]?

(a) El mandato de muestreo del Perito Independiente

814. El Tribunal recuerda que se impartieron instrucciones al Sr. MacDonald de revisar el trabajo realizado por los peritos de las Partes y de muestrear aquellos sitios donde cualquiera de los peritos de las Partes o ambos peritos hubieran hallado indicios de contaminación. El Tribunal consideró lo siguiente:

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975 Se considera que cuestiones tales como la interpretación de cromatogramas, el cálculo de valores de fondo, y las cuestiones de 'orden de magnitud' se encuentran dentro de su esfera de conocimientos y competencia.

> 590. … IEMS y GSI tuvieron amplia oportunidad para tomar muestras en las partes de los Bloques que consideraron necesarias. El perito del Tribunal, por lo tanto, circunscribirá su trabajo a los sitios específicos en los que se tomaron muestras de suelo y se perforaron pozos de muestreo de aguas subterráneas. Aunque, debido a las diferencias entre las prácticas de muestreo de IEMS y GSI, el perito deberá volver a tomar muestras en los sitios en los que los peritos de una u otra parte detectaron la presencia de contaminantes y delinear la gravedad de dicha contaminación, no se tomarán muestras de otros sitios que los peritos de las Partes no hayan muestreado[976].
>
> 592. … el Tribunal desea aclarar que su proceder no pretende dar a las Partes una oportunidad para introducir nueva evidencia (a excepción de la solicitada por el Tribunal para asistir a su perito). Las Partes han tenido ya amplia oportunidad de presentar sus casos. El propósito de la nueva etapa es que el perito del Tribunal valide un enfoque o el otro con respecto al resto de los temas técnicos[977].

815. Además, el Tribunal observó lo siguiente:

> 596. Huelga apuntar que se debe hacer todo lo posible para que la determinación de daños adeudados se base en la situación existente al momento de la salida del Consorcio en julio de 2009[978].

816. Por lo tanto, se impartieron instrucciones al Sr. MacDonald de no realizar un estudio *de novo* de la condición ambiental de los dos Bloques. El Tribunal reconoció que esta instrucción significaba que con toda probabilidad habría contaminación en los dos Bloques que no fue capturada por ninguno de los peritos de las Partes ni por el Perito Independiente del Tribunal:

> 595. El Tribunal tiene presente que es casi seguro que el muestreo realizado por ambos peritos no haya capturado adecuadamente toda la contaminación. Efectivamente, sin perjuicio de la declaración inicial de GSI de que su intención era "lograr una evaluación completa de las condiciones ambientales actuales de cada una de las 74 instalaciones hidrocarburíferas investigadas por IEMS en el CPUF, el Bloque 7, y el Bloque 21", no fue eso lo que hizo. Como indicó Ecuador, GSI admitió haber restringido su investigación a la tarea de invalidar las CAR identificadas por IEMS. El Sr. Connor además confirmó que GSI no intentó estimar completamente el grado de contaminación en los Bloques,

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976 Decisión Provisional, párr. 590.

977 *Ibid.*, párr. 592.

978 *Ibid.*, párr. 596.

> de forma separada de su análisis del trabajo de IEMS, y reconoció que ambos peritos pueden haber dejado pasar ejemplos de contaminación. Como sea, el ejercicio actual es un análisis preciso e imparcial del trabajo que realizaron los peritos, quienes tuvieron muchas oportunidades de examinar los Bloques. Su trabajo debe ahora ser evaluado por el perito de conformidad con las conclusiones del Tribunal979. [Énfasis agregado].

817. Es dable mencionar otros dos temas. En primer lugar, tal como se observara *supra*, se impartieron instrucciones al Sr. MacDonald de que no considere la adjudicación de responsabilidad a Perenco por su porcentaje de contaminación cuya existencia determinó en los sitios relevantes. En segundo lugar, también se le impartieron instrucciones de que realice su trabajo sin tener en cuenta las determinaciones realizadas por el tribunal de *Burlington*[980].

(b) ¿El Perito Independiente se extralimitó en su mandato al realizar muestreos en sitios que no fueron muestreados por ninguno de los peritos de las Partes?

818. Perenco se quejó de que el Perito Independiente decidió muestrear determinados sitios en donde ninguno de los peritos de las Partes había determinado la existencia de contaminación. El Perito Independiente supuso además que determinadas piscinas de lodo contenían excesos sin haberlas muestreado[981]. Por lo tanto, Perenco sostuvo que el Tribunal debe excluir estos sitios (piscinas en Oso 9A, Oso 9 B, Oso 9, Piscinas 2, 4, la piscina Yuralpa SL, y la piscina 2 de Yuralpa G[982]) de la contaminación total cuantificada en los Bloques 7 y 21[983].

819. Durante su presentación de apertura a las Partes y al Tribunal el 11 de marzo de 2019, en la que revisó su trabajo y respondió a los comentarios escritos de las Partes, el Sr.

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979 *Id.*

980 *Ibid.*, Diapositiva 3.

981 Comentarios de Perenco sobre el Informe del Perito Independiente de 22 de febrero de 2019, párrs. 56 y 57.

982 Presentación de Cierre de Perenco, pág. 21.

983 Por "contaminación total cuantificable" [Traducción del Tribunal], el Tribunal hace referencia a la estimación que realiza el Perito de la contaminación total en esas zonas de los Bloques que fueron identificadas por uno u otro de los peritos de las Partes y posteriormente muestreadas y delineadas adicionalmente por el Perito. Debido al mandato restringido del Perito, esto no debiera considerarse como una estimación firme de la posible contaminación total en los dos Bloques.

MacDonald comenzó resumiendo los "mandatos que rigieron el alcance de su trabajo"[984]. Los primeros dos puntos en su diapositiva rezaban lo siguiente:

> El estudio del suelo y las aguas subterráneas se circunscribió a zonas ya muestreadas por las Partes.
>
> El estudio de las piscinas de lodo se circunscribió a aquellas de las que se tenía conocimiento que habían sido utilizadas por Perenco[985].

820. En consecuencia, el Sr. MacDonald trazó una distinción entre el muestreo de los suelos y aguas subterráneas, por una parte, y el muestreo de las piscinas de lodo por la otra. Teniendo en cuenta la Decisión Provisional sobre la Reconvención en su conjunto, el Tribunal considera que no se trató de una interpretación irrazonable de las órdenes del Tribunal. En lo que respecta al primer punto en la diapositiva del Sr. MacDonald, en el párrafo 590 de la Decisión Provisional sobre la Reconvención, el Tribunal determinó lo siguiente: "El perito del Tribunal, por lo tanto, circunscribirá su trabajo a los sitios específicos en los que se tomaron muestras de suelo y se perforaron pozos de muestreo de aguas…"[986].

821. En lo que se refiere a las piscinas de lodo, la Decisión Provisional sobre la Reconvención fue clara al expresar la intención del Tribunal de que Perenco resultaría responsable de todo exceso hallado en las piscinas de lodo que Perenco hubiera utilizado. Cuando se desarrollaron las instrucciones del Perito Independiente en la Decisión Provisional sobre la Reconvención, le pareció al Tribunal que la diferencia principal entre las Partes en lo que respecta a las piscinas de lodo no era el *número* de piscinas de lodo que Perenco había utilizado, sino de ese universo de piscinas, *¿cuántas estaban revestidas en contraposición a aquellas no revestidas*? Esto puede observarse en el análisis del párrafo 502 de la Decisión Provisional sobre la Reconvención:

> 502. La Lista de Piscinas de Lodo Taponadas adjunto como Apéndice A al Escrito de la Demandante Posterior a la Audiencia sobre Reconvenciones, que se preparó con la colaboración de ambas Partes y por

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984 Presentación Directa del Perito, 11 de marzo de 2019, pág. 1. [Traducción del Tribunal]

985 Tr. (1) (MacDonald) (11 de marzo de 2019) 20. [Traducción del Tribunal]

986 Decisión Provisional, párr. 590.

> la cual el Tribunal expresa su gratitud, lamentablemente muestra que hay discrepancias sustanciales sobre la cantidad de piscinas revestidas y no revestidas. La 'Lista Maestra' registra desacuerdos al respecto en al menos 26 de 79 casos; mientras que la lista titulada 'Piscinas construidas por Perenco' muestra un porcentaje aun mayor de desacuerdo (14 de 18). La lista 'Piscinas construidas por operadores anteriores' arroja 12 discrepancias (de 63 entradas) y numerosas opiniones (36) de desconocimiento al respecto[987]. [Énfasis agregado]

822. Para que quede claro, Perenco *no* se quejó de que el Perito Independiente muestreara piscinas de lodo que hubieran sido utilizadas por otros operadores[988]. Perenco no discrepa de la afirmación del Informe Pericial Consolidado de que:

> Según el Tribunal, la condición de piscinas ajenas a Perenco, ya sea aquellas construidas con anterioridad al mes de septiembre de 2002 o con posterioridad al mes de julio de 2009, no era relevante para la reclamación y quedaron excluidas de la evaluación de Ramboll[989].

823. El Informe Consolidado del Perito Independiente observa además de manera explícita que el Sr. MacDonald circunscribió su muestreo a las piscinas que los representantes de las Partes *acordaron* que habían sido utilizadas por Perenco[990]. El motivo de queja de Perenco es que el Perito Independiente muestreó piscinas de lodo ciertamente utilizadas por Perenco pero que anteriormente no habían sido muestreadas por los peritos de las Partes[991] o que el Perito Independiente no muestreó determinadas piscinas utilizadas por Perenco, sino que en cambio infirió la existencia de contaminación de dichas piscinas[992].

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987 *Ibid.*, párr. 502.

988 Las Notas de la Tabla 5.1 indican instancias en las que se identificó que las piscinas de lodo no se encontraban vinculadas a operaciones de Perenco y, por ende, no fueron pasibles de muestreo. Véanse notas 4 y 5.

989 Informe Pericial Consolidado, "Piscinas de Lodo" pág. 237, segunda viñeta. [Traducción del Tribunal]

990 *Ibid.*, Sección 7.1. "Piscinas de Lodo", segundo párr.: "Según el Tribunal, la condición de piscinas ajenas a Perenco, ya sea aquellas construidas con anterioridad al mes de setiembre de 2002 o con posterioridad al mes de julio de 2009, no eran relevantes para la reclamación y quedaron excluidas de la evaluación de Ramboll. Por lo tanto, las piscinas de lodo consideradas en nuestro trabajo se circunscribieron a aquellas que las Partes acordaron se encontraban asociadas a operaciones anteriores de Perenco. Se inspeccionaron todas las zonas de piscinas de lodo de Perenco, y se tomaron muestras de casi la totalidad de ellas. …". [Traducción del Tribunal]

991 *Ibid.*, pág. 93: "Sin embargo, en Oso 9A y 9B, Ramboll determina la remediación de 7 piscinas de lodo aunque ni IEMS ni GSI hallaron indicios de excesos en estos sitios. En consecuencia, estas zonas se encontraban más allá del alcance del estudio de Ramboll". [Traducción del Tribunal]

992 Informe Pericial Consolidado, pág. 93-94: "…el propio muestreo de Ramboll contradice el supuesto de que las piscinas adyacentes tenían contenidos similares: Ramboll determinó que la piscina 8 en Oso 9 cumplía con el estándar, a pesar de que la Piscina 9 adyacente no lo cumplía". [Traducción del Tribunal]

824. No fue la intención del Tribunal que Perenco pudiera evitar su responsabilidad por cualquier exceso determinado por el Perito Independiente para las piscinas de lodo que Perenco hubiera utilizado. Desde la perspectiva del Tribunal, los objetivos principales en lo que se refiere a las piscinas de lodo eran dos: (i) que el Sr. MacDonald llegara 'al fondo' de la controversia entre las Partes respecto de las piscinas revestidas y no revestidas; y (ii) garantizar que *no* se responsabilizara a Perenco por las piscinas construidas por operadores anteriores que Perenco no hubiera utilizado. Ello se dejó en claro en el párrafo 604 de la Decisión Provisional sobre la Reconvención:

> 604. El mismo ejercicio deberá realizarse con relación a las piscinas de lodo utilizadas por Perenco hasta el 16 de julio de 2009. No se puede responsabilizar a Perenco por las piscinas construidas por operadores anteriores que Perenco misma no utilizó, ya que por definición podría demostrar que no puede atribuírsele daño alguno causado por la filtración de lixiviados desde dichas piscinas. Solo puede responsabilizársela por el daño resultante de las piscinas que haya utilizado o construido. Es necesario determinar si la disposición de los lodos de perforación ocurrió en piscinas impermeabilizadas correctamente construidas o en una piscina no impermeabilizada o en una que haya sido incorrectamente construida y que por lo tanto pueda ser más susceptible de causar lixiviaciones[993]. [Énfasis agregado].

825. Como parte de su proceso de planeamiento, el Sr. MacDonald proporcionó una lista de piscinas de lodo a las Partes para que ellas efectuaran comentarios[994]. Incluidas en esa lista se encontraban Oso 9A y Oso 9B[995]. (Se había observado la utilización de estos dos sitios por parte de Perenco en el informe pericial de GSI del año 2012[996]). En lo que se refiere a la piscina de relleno sanitario de Yuralpa y la piscina 2 de Yuralpa G, el historial del desarrollo del Bloque 21 resulta claro: Tal como se refleja en la lista de GSI de los pozos

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993 Decisión Provisional, párr. 604.

994 Se complementó esta correspondencia con conversaciones con los representantes de Parte. El Sr. MacDonald comentó lo siguiente: "… Creo que la piscina – lo denominaré el "Mandato de las Piscinas" – con información disponible e intentos, intentos muy firmes, de afirmar con las Partes que ninguna tenía objeción alguna" [Traducción del Tribunal]. Tr. (1) (MacDonald) (11 de marzo de 2019) 132:16-19

995 Durante la audiencia, el Sr. MacDonald observó que había enviado un correo electrónico o una carta en referencia al muestreo de Oso 9A y 9B. "Nos quedó claro a partir de declaraciones hechas en el yacimiento que esas zonas recibieron materiales de las piscinas de lodo de Perenco" [Traducción del Tribunal]. Tr. (1) (MacDonald) (11 de marzo de 2019) 130:15-17

996 GSI ER I, Apéndice L54 "Recopilación de Información Específica del Sitio para la Plataforma de Oso 09, 12, 15, 16, 17, 18, 19 y 20, Bloque 7" [Traducción del Tribunal], págs. 4 y 9.

perforados en Yuralpa, con la excepción de tres pozos perforados por Texaco (Yuralpa 1) y Oryx (Yuralpa Centro 1 y 2), el yacimiento Yuralpa fue desarrollado por Perenco[997]. En lo que respecta a las piscinas 2 y 4 de Oso 9, estas piscinas no fueron muestreadas por el Sr. MacDonald, pero estaban situadas dentro de una zona de piscinas de lodo de gran tamaño y se tomaron muestras de las piscinas adyacentes a estas dos (piscinas 1, 3 y 6[998]). Todas esas piscinas muestreadas mostraron excesos regulatorios. La estimación de contaminación en estas dos piscinas resultó de la deducción que hizo el Sr. MacDonald de los excesos regulatorios que había confirmado en las piscinas adyacentes[999].

826. De las conversaciones con el Perito Independiente acerca su mandato al comienzo de su trabajo, el Tribunal interpretó que este consideró tomar muestras de aproximadamente la mitad de las piscinas de Perenco e inferir de los resultados de ese muestreo las estimaciones de contaminación en el resto de las piscinas. En los hechos, el Sr. MacDonald hizo más muestreos que inferencias:

> Por lo tanto, las piscinas de lodo consideradas en nuestro trabajo se circunscribieron a aquellas que las Partes acordaron se encontraban asociadas con operaciones anteriores de Perenco. Se inspeccionaron todas las zonas de piscinas de lodo de Perenco, y se tomaron muestras de casi la totalidad de estas[1000]. [Énfasis agregado]

827. En virtud de las determinaciones del Tribunal en la Decisión Provisional sobre la Reconvención, específicamente su intención establecida de que se evaluara la totalidad de las piscinas de lodo utilizadas por Perenco, el Tribunal no considera irrazonables los motivos que llevaron al Sr. MacDonald a decidir tomar muestras o adjudicar responsabilidad mediante la utilización limitada de inferencias en las piscinas de lodo enumeradas en el párrafo [818] *supra*. Por lo tanto, sostiene que no se extralimitó en su mandato.

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997 GSI tomó muestras / véase Tr. (1) 132.

998 Apéndice B.4 de GSI ER II, Lista de Pozos, pág. 4.

999 Informe del Perito Independiente, Tabla 5.1: "Las Piscinas de Lodo 2 y 4 en Oso 9 estaban relacionadas con Perenco pero no fueron estudiadas por Ramboll ni por las Partes. Los contenidos de estas dos piscinas de lodo son probablemente de calidad similar a aquellos encontrados en la Piscina de Lodo 1 y las Piscinas de Lodo 3 y 5 adyacentes, respectivamente". [Traducción del Tribunal]

1000 *Id.* Sección 7.1. [Traducción del Tribunal]

(c) ¿El Perito Independiente se extralimitó en su mandato al no realizar muestreos en sitios que fueron muestreados por alguno de los dos peritos de las Partes?

828. Mientras que Perenco planteó numerosas objeciones que, de ser aceptadas, habrían reducido significativamente el alcance de la contaminación hallada por el Perito Independiente, Ecuador planteó un serie diferente de cuestiones centrándose en la imposibilidad o incapacidad del Sr. MacDonald, en su caso, para muestrear determinados sitios que fueron muestreados por uno u otro de los peritos de las Partes.

829. Ecuador señaló que el Perito Independiente no muestreó todos los sitios en los que hallaron contaminación uno u otro de los peritos de las Partes. Por ejemplo, IEMS investigó la situación de las aguas subterráneas en el Relleno de Yuralpa ("Yuralpa LF"), aunque Ramboll no pudo muestrear este sitio debido a dificultades logísticas[1001]. Ecuador adujo que en tanto al menos un pozo en cada sitio presenta un exceso detectado de TPH y/o bario, sería razonable suponer que el agua subterránea en Yuralpa LF resultaría igualmente afectada[1002]. Ecuador observó además que Perenco instaló también pozos en Yuralpa B y utilizó piscinas de lodo en ese sitio. Debido a una omisión, Ramboll no estudió las piscinas de lodo de Perenco en ese sitio[1003]. Dado que el Sr. MacDonald determinó que el 87% de las piscinas de lodo construidas o utilizadas por Perenco no se avenían a los criterios de funcionamiento del RAOHE, Ecuador adujo que resultaba razonable suponer que las piscinas de lodo en este sitio tampoco habrían cumplido con los estándares prescritos por el RAOHE[1004]. Por último, durante la Audiencia Pericial, Ecuador hizo referencia a pruebas de que Perenco había desechado materiales de las piscinas de lodo generadas en otros sitios en Payamino 16[1005]. Nuevamente, teniendo en cuenta que el 85% de las piscinas de lodo de Perenco no se ajustaban a los criterios de funcionamiento del RAOHE, Ecuador adujo

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1001 Informe del Perito Independiente, Sección 4.2.4.

1002 Informe Pericial Consolidado, pág. 239, párr. 7.

1003 Tr. (1) (MacDonald) (11 de marzo de 2019) 30:12-22.

1004 Tr. (2) (MacDonald) (12 de marzo de 2019) 395:2-10.

1005 Decisión sobre Reconvenciones de *Burlington*.

que resulta razonable suponer que las piscinas de lodo en este sitio tampoco se habrían ajustado al RAOHE[1006].

830. El Tribunal ha tenido consideración de esta cuestión y cree que es justo, habida cuenta de las circunstancias planteadas *supra*, ajustar al alza en USD 7,7 millones los daños estimados por el Sr. MacDonald y que el Tribunal determinó que resultaban atribuibles a Perenco.

831. Una cuestión relacionada es el intento por parte de Ecuador de hacer que el Tribunal incremente la indemnización por daños debido a que Perenco llevó a cabo determinadas reparaciones de pozos de producción que habían sido perforados por sus predecesoras. Ecuador sostuvo que al igual que la perforación inicial de los pozos de producción habría generado desechos, también lo habrían hecho las reparaciones. En el período previo a la audiencia, el Tribunal coincidió con la solicitud de Ecuador de que Perenco presentara sus propios informes de las reparaciones[1007].

832. Esta cuestión se planteó relativamente tarde en el contexto del procedimiento. Perenco objetó esto con fundamento en el hecho de que a pesar de que hace siete años Perenco presentó algunas pruebas sobre las reparaciones que había realizado, Ecuador ahora pretendía ampliar el expediente en lo que respecta a ese tema histórico, a la vez que continúa reteniendo información acerca de sus propias operaciones que en realidad resultaba relevante para la decisión del Tribunal en esta etapa, concretamente, registros de las reparaciones de Petroamazonas posteriores a julio de 2009 que se le había ordenado presentar[1008]. (El Tribunal ya ha expresado su discrepancia con la caracterización que hace Perenco del presunto incumplimiento de la Resolución Procesal No. 17. por parte de Ecuador).

1006 Tr. (2) (MacDonald) (12 de marzo de 2019) 397:8-18.

1007 La solicitud de Ecuador se planteó en su carta de 22 de enero de 2019, pág. 2; esta solicitud fue otorgada por el Tribunal en su carta de fecha 8 de febrero de 2019.

1008 Carta de Perenco dirigida al Tribunal de fecha 5 de febrero de 2019.

833. Finalmente, el Perito Independiente estuvo de acuerdo con Perenco en que la cuestión se había planteado de manera relativamente reciente y que los informes de reparaciones que había recibido en la fase temprana de su trabajo eran relativamente pocos en cantidad. Fue solo en la última etapa del procedimiento de reconvenciones que se le proporcionó más documentación relacionada con las reparaciones[1009]. De su análisis de la documentación, aunque el Sr. MacDonald coincidió con los abogados de Ecuador en que las reparaciones generarían residuos[1010], con base en la información ante él (que indicó la utilización de fluidos de perforación, aunque no qué aditivos químicos fueron utilizados, ni si se utilizó sulfato de bario), no pudo estimar de manera razonable la posible contribución de Perenco en los sitios en los que se realizaron reparaciones.

834. Se trata de un ejercicio de juicio técnico y el Tribunal rechaza cuestionar al Perito Independiente en su determinación. Por lo tanto, se rechaza la reclamación en materia de reparaciones de Ecuador.

(d) El debate sobre el uso del suelo

835. Durante sus visitas a los Bloques, el Sr. MacDonald examinó la Cuenca del Río Napo y las características dominantes de los Bloques que luego describió brevemente en su Informe:

> … Observé que las condiciones topográficas locales de las plataformas variaban considerablemente, en tanto algunas se ubicaban en barrancos de pendiente mayor en regiones montañosas, otras dentro de llanuras pantanosas y otras dentro de entornos agrícolas. Casi todos los sitios, sin embargo, estaban rodeados de selva tropical de diverso valor ecológico (por ejemplo, bosques primarios y secundarios, así como bosques con evidencia de uso agrícola concurrente). Tal como se describe en detalle… si bien algunas porciones de este bosque se designan en el sentido de tener especial importancia, se considera que este ecosistema de selva tropical en su totalidad es sensible desde el punto de vista ambiental y tiene valor intrínseco, independientemente de si es prístino o no[1011].

1009 Tr. (2) (MacDonald) (12 de marzo de 2019) 307.

1010 Tr. (1) (MacDonald) (11 de marzo de 2019), 133:8-137:21; Tr. (2) (MacDonald) (12 de marzo de 2019) 310:15-315:14.

1011 Informe Pericial Consolidado, pág. 24. [Traducción del Tribunal]

836. Ambas Partes objetaron ciertas designaciones de uso del suelo empleadas por el Perito Independiente. Dejando de lado algunas otras objeciones a sus designaciones, la principal cuestión controvertida entre las Partes sobre este aspecto del Informe era que Ecuador consideraba que ciertos sitios que el Perito Independiente designaba como "agrícolas" deberían haber sido designados como "ecosistema sensible" y que dos cuerpos de agua deberían haberse clasificado como áreas de ecosistema sensible en lugar de agrícolas[1012]. Perenco estimaba que ciertos sitios que el Perito Independiente designó como "ecosistema sensible" deberían haberse considerado "agrícolas". No es necesario reiterar las objeciones en detalle, ya que se encuentran expuestas en el párrafo 670 y ss. *supra*.

837. El enfoque que debía adoptar el Perito Independiente se exponía en el párrafo 495 de la Decisión Provisional sobre la Reconvención bajo el título "Conclusión sobre criterios de uso del suelo":

> 491. … el Tribunal considera que el tratamiento de esta cuestión debería guiarse por la práctica de las autoridades ecuatorianas relacionada con los Bloques. La evidencia muestra que las autoridades aceptaron la aplicación de criterios de uso de suelo industrial en algunas partes de los Bloques 7 y 21, en particular, en el Plan de Remediación de enero de 2003 del Relleno Sanitario Payamino, Payamino 22, estación de procesamiento (CPF) Payamino, CPF Coca y CPF Jaguar aprobado por el Ministerio, el informe de limpieza de un derrame en Payamino 19 en junio de 2009, el EIA del Consorcio para la construcción de las plataformas Oso A y Oso B y la plataforma Yuralpa Norte en abril y octubre de 2006 y, lo que es más significativo, en los estudios de impacto ambiental encargados por Ecuador en 2010.
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> 492. Las autoridades ecuatorianas aceptaron, análogamente, la aplicación de criterios de uso de suelo agrícola en áreas adyacentes a las plataformas de los Bloques 7 and [sic] 21 tales como en el plan de remediación aprobado por el Ministerio para el derrame ocurrido en mayo de 2007 producido desde la línea de flujo Oso 2, el plan de remediación aprobado por el Ministerio en enero de 2008 para el derrame de la línea de flujo Gacela-Payamino ocurrido en octubre de 2007, y en los estudios de impacto ambiental encargados por Ecuador en 2010. En este procedimiento, IEMS misma aceptó que las áreas que rodeaban Coca 6, Coca 8, Lobo 3, Lobo 1, Oso 9, Mono CPF, y la CPF Payamino se utilizaban principalmente con fines agrícolas.

[1012] *Ibid.*, pág. 10. Ecuador arguyó además que el Perito no captó totalmente el alcance de la contaminación en las áreas evaluadas.

> 493. Esto no es lo mismo que decir que, una vez seleccionados, los criterios de uso de suelo sean irrevocables y la decisión no pueda modificarse. Sin embargo, existe un valor probatorio significativo que surge de la aceptación de las autoridades de criterios de uso de suelo particulares respecto de la misma área a los efectos de evaluar la remediación de suelos.
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> 494. También es indudable para el Tribunal que la calificación de ecosistema sensible no se limita a las zonas protegidas designadas. El RAOHE deja en claro que la designación se aplica a áreas "tales como Patrimonio de Áreas Naturales del Estado y otros identificados en el correspondiente Estudio Ambiental". El enfoque inicial de GSI consistió en restringir el uso del criterio de ecosistema sensible únicamente a esas áreas. El Tribunal observa que la propia GSI aceptó que el "criterio de ecosistema sensible" podía aplicarse a numerosos sitios en los Bloques que se superponían con las áreas de ecosistemas sensibles designadas por el Estado: CPF Payamino, Payamino 1, Payamino 2-8, Payamino 19, Waponi-Ocatoe y Nemoca.
>
> (3.1) Conclusión sobre criterios de uso de suelo
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> 495. El Tribunal concluye que, teniendo en cuenta el mandato de la Constitución de 2008 a favor de la protección del medio ambiente, en caso de duda, cuando se considere que un sitio puede pertenecer a una de dos clasificaciones, debería aplicarse la que redunde en un uso más estricto del suelo. El Tribunal considera que, si no se ha designado un uso posterior del suelo, el foco del Artículo 395.4 de la Constitución de 2008 sobre la restauración íntegra del medio ambiente debería prevalecer para determinar el uso apropiado del suelo y dicho uso debería favorecer la clasificación que resulte más protectora del medio ambiente y más razonable dadas las circunstancias particulares del caso. Al mismo tiempo, las determinaciones anteriores de las autoridades ecuatorianas cuentan con considerable valor probatorio[1013]. [Énfasis agregado]

838. Esto fue reiterado en forma sumaria en el párrafo 611(15) de la Decisión Provisional sobre la Reconvención del Tribunal:

> En caso de duda respecto de los criterios de uso de la tierra aplicable [sic], sujeto a determinaciones anteriores de las autoridades del Ecuador que tienen un valor probatorio importante, debe aplicarse la designación más estricta del uso de la tierra[1014].

839. En estas instrucciones, el Tribunal pretendía darle al Perito Independiente cierto grado de libertad para determinar lo que correspondía en las circunstancias de un caso específico. Si

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1013 Decisión Provisional, párrs. 491-495 [referencias en las notas al pie omitidas].

1014 *Ibid.*, párr. 611(15).

las autoridades ecuatorianas habían realizado algunas determinaciones de uso del suelo anteriormente, a aquellas debía atribuírseles "considerable valor probatorio", pero el Tribunal no pretendía mediante esta indicación sostener que cualquier determinación anterior semejante pondría fin a la cuestión en casos específicos ni que el Perito Independiente no podría emplear su propio criterio en vista de las características específicas de un sitio en particular. (De lo contrario, el Tribunal habría utilizado palabras tendientes a expresar que "las determinaciones anteriores de las autoridades ecuatorianas sobre el uso del suelo prevalecerán").

840. Cabe recordar que, luego de haber efectuado un muestreo de los sitios, el Perito Independiente debía proceder a delinear el alcance de la contaminación (dado que la metodología de mapeo de IEMS había sido rechazada y el Tribunal tenía dudas acerca de las delineaciones de GSI). Por ende, la cuestión de los criterios de uso del suelo surgiría recién una vez que Ramboll hubiera identificado tanto la ubicación como el tipo de contaminación y delineado su alcance. Muchas de las determinaciones no eran blanco o negro; el Sr. MacDonald observó, por ejemplo, que el TULAS definía el suelo agrícola en el sentido de incluir tierras que "mantienen un hábitat para especies permanentes y transitorias, además de flora nativa"[1015]. En consecuencia, personas razonables pueden disentir en cuanto a si un sitio en particular que ostentaba características agrícolas también podría tener una parte que pudiera considerarse ecosistema sensible o en qué circunstancias. En la Decisión Provisional sobre la Reconvención, el Tribunal reconoció que podía haber casos de duda en los que podría considerarse que un sitio se encuentra comprendido en cualquiera de dos designaciones e instruyó que, en dichas circunstancias, se aplique la designación más estricta. La intención era que el Perito Independiente tuviera en cuenta la manera en que las autoridades habían tratado un sitio en particular en el pasado, pero que, si por alguna razón consideraba que debía aplicarse una designación de uso del suelo más estricta, pudiera decidirlo. Al mismo tiempo, no obstante, el Perito Independiente no estaba obligado a recurrir por defecto a la designación de ecosistema sensible tal como parecían sugerir los alegatos de Ecuador. Por consiguiente, en algunos casos, el Sr.

[1015] Libro VI, Anexo 2, §2.50 del TULAS, citado en Presentación Directa, Diapositiva 8.

MacDonald adoptó una clasificación de uso del suelo que era favorable a la posición de Perenco (que Ecuador consideró que no era suficientemente estricta) y, en otros casos, adoptó una clasificación que era favorable a la posición de Ecuador (y que fue impugnada por Perenco por considerarla indebidamente estricta)[1016].

841. El Sr. MacDonald y su equipo estudiaron en los dos Bloques el expediente de esta reconvención, incluso presentaciones anteriores a las autoridades ecuatorianas, y consultaron los mapas del Ministerio de Agricultura. Tras llevar a cabo las actividades de muestreo, graficaron las áreas de contaminación delineadas en unos 51 sitios (utilizando fotografías aéreas). El Tribunal considera que no se encuentra en mejores condiciones de efectuar estas determinaciones de uso del suelo sitio por sitio y, por lo tanto, se niega a interferir en ellas.

(e) Piscinas de lodo

842. La cuestión de las piscinas de lodo es una cuestión más técnica que de mandato, aunque en vista de la cantidad de tiempo dedicado a la cuestión en el curso de la presente reconvención, el Tribunal considera apropiado analizar la decisión del Perito Independiente de aplicar la Tabla 7(a) del RAOHE a todas las piscinas de lodo de Perenco.

843. El Tribunal ya se ha referido a la controversia de las "piscinas de lodo revestidas/no revestidas". La práctica histórica de Perenco con respecto a las piscinas de lodo no estaba bien documentada. En una etapa previa del presente arbitraje, luego de que se le ordenara exhibir documentos relativos al diseño y a la construcción de las piscinas de lodo, Perenco afirmó lo siguiente: "…[que] no tiene una política escrita específica para la construcción, la limpieza, el monitoreo, las pruebas y el taponamiento de piscinas"[1017]. Perenco invocó principalmente el testimonio del Sr. Saltos y notas de entrevistas a exempleados de Perenco preparadas por IEMS, al igual que cierta evidencia fotográfica para demostrar que en

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1016 En su presentación en el Día 2 de la audiencia pericial, el Sr. MacDonald reaccionó a las críticas de ambas Partes respecto de sus designaciones (abordando las críticas de Ecuador en las Diapositivas 7-11 y las de Perenco en las Diapositivas 39-46).

1017 Decisión Provisional, párr. 501, que cita la respuesta de Perenco a la Solicitud #12, 18 de enero de 2013.

algunas piscinas se utilizaron revestimientos. Sin embargo, el Tribunal también era consciente de una declaración realizada por un exempleado de Perenco en el sentido de que, incluso cuando se colocaron esos revestimientos, los residuos no se depositaron correctamente[1018]. Por este motivo, el Tribunal concluyó que las pruebas "eran diversas y que no respaldaban completamente la postura de Perenco porque un exempleado declaró que no se tuvo la precaución debida al depositar los lodos de perforación de forma tal que los revestimientos se agrietaron debido a las altas temperaturas"[1019]. Esto planteó la posibilidad de que, aun si Perenco revistió algunas piscinas, la forma en que preparó las piscinas, mezcló los lodos o los depositó en las piscinas pudo dañar los revestimientos que podrían haberse colocado.

844. Además, en una etapa anterior del procedimiento de Reconvención, los peritos de Perenco trataron todas las piscinas de lodo de Perenco como si hubieran estado "impermeabilizadas" (básicamente, equiparando las piscinas de lodo sin revestimiento impermeable colocado antes de depositarse el lodo, pero que se decía estaban revestidas con arcilla, con las piscinas con revestimientos impermeables). El Tribunal desaprobó este enfoque:

> También parece haber desacuerdos sobre el hecho de si una piscina que podría haber sido construida sobre un suelo arcilloso debería considerarse "impermeabilizada" o no; el Sr. Connor, de GSI, se inclinó por la respuesta afirmativa, mientras que IEMS opinó lo contrario. El Tribunal no está preparado para equiparar piscinas que se han considerado impermeables por tener una base de arcilla con piscinas que han sido revestidas por dentro utilizando una barrera sintética impermeable. Para ello, sería necesario que el Tribunal asuma, en primer lugar, que la base de una piscina no revestida está formada, efectivamente, por arcilla. IEMS presentó prueba de que esto no es necesariamente lo que ocurre; en algunos casos hay suelo arenoso cerca de las piscinas. Durante el contrainterrogatorio, el Sr. Connor admitió, por ejemplo, al mirar la piscina de Coca 8, que GSI no realizó prueba geotécnica alguna y asumió que la base de la piscina estaba revestida con arcilla[1020].

1018 *Ibid.*, párr. 501.

1019 *Id.*

1020 *Ibid.*, párr. 503.

845. La existencia de revestimientos capaces de actuar como barrera impermeable entre los lodos y el suelo adyacente (y posiblemente las aguas subterráneas) es de vital importancia, en tanto el RAOHE impone dos estándares diferentes en su Tabla 7. A las piscinas no revestidas se aplica un estándar más estricto para el tratamiento de los lodos que el que se aplica a las piscinas que han sido revestidas con una barrera impermeable.

846. Por ende, al Perito Independiente se le indicó que determinara el estado de las piscinas de lodo que había utilizado o construido Perenco. El Tribunal instruyó que "[s]i un pozo tuviera recubrimiento impermeable, se aplica la Tabla 7(b). Si no tuviera un recubrimiento impermeable, se aplica la Tabla 7(a). En caso de duda, se aplica el estándar de mayor protección ambiental de la Tabla 7(a)"[1021].

847. El Sr. MacDonald y su equipo examinaron las piscinas de lodo que habían sido utilizadas por Perenco. Entre otras cosas, las piscinas de lodo fueron "inspeccionadas visualmente a fin de evaluar la integridad física de las piscinas de lodo, identificar la presencia de algún estrato de cobertura de suelo diferente y determinar si había evidencia de algún material de revestimiento sintético en las piscinas de lodo"[1022]. En la nota al pie 180 de su Informe, el Perito Independiente comentó lo siguiente:

> Las Partes no han ofrecido evidencia directa de presencia de revestimiento en alguna piscina de lodo específica. Como parte de la investigación de Ramboll, los orificios se diseñaron de modo de terminar por encima de la base sospechada de la piscina de lodo para evitar perforar cualquier posible revestimiento (en caso de existir) y crear un trayecto de migración vertical para la contaminación. Las fotografías tomadas por Perenco al momento de cierre de algunas piscinas de lodo muestran que comúnmente se utilizaba una excavadora para tratar el material de las piscinas de lodo en el lugar, lo cual probablemente habría tenido como consecuencia que cualquier material de revestimiento se rompiera. Por lo tanto, Ramboll ha adoptado el supuesto conservador de que ninguna de las piscinas está revestida o de que los revestimientos probablemente no están intactos[1023]. [Énfasis agregado]

1021 *Ibid.*, párr. 611(16).

1022 Informe Pericial Consolidado, Sección 5.2.1. [Traducción del Tribunal]

1023 *Ibid.*, nota al pie 142. [Traducción del Tribunal]

848. Reformuló este hallazgo en los comentarios que siguen a la Tabla 5.1, la tabla resumida sobre hallazgos en las piscinas de lodo:

> No se aportó información suficiente para confirmar que existan revestimientos sintéticos o de arcilla dentro de alguna piscina de lodo específica. Cabe aclarar que Ramboll no perforó la base de las piscinas de lodo para determinar la presencia o ausencia de material de revestimiento, ya que esto habría comprometido las unidades si hubieran existido revestimientos. En algunos casos, Ramboll efectivamente observó material de revestimiento roto en los perímetros de algunas piscinas de lodo, pero no tenía información respecto de su condición o grado lateral en el resto de las piscinas de lodo. Por lo tanto, sin excepción, los datos disponibles de los ensayos de degradación se compararon de manera conservadora con los estándares correspondientes a las piscinas de lodo no revestidas que se presentan en la Tabla 7a del RAOHE[1024]. [Énfasis agregado]

849. Por ende, al final, el Sr. MacDonald no se convenció de que hubiera evidencia suficiente de revestimientos impermeables competentes (es decir, revestimientos que, si efectivamente se hubieran instalado antes del depósito de lodos, habrían mantenido su integridad) como para justificar la aplicación del estándar menos estricto consignado en la Tabla 7(b) del RAOHE[1025]. En su Presentación Directa de Apertura en la Audiencia Pericial, el Sr. MacDonald afirmó que, al igual que GSI, Ramboll también observó porciones de material de revestimiento sobre la superficie del terreno que rodeaba algunas piscinas de lodo, pero que dicho material "se observó en solo 8 de las 38 piscinas de lodo de Perenco inspeccionadas (21%), con geomallas observadas cerca de la superficie de las piscinas en otras tres piscinas de lodo (probablemente como parte del material de recubrimiento)[1026]. Los informes de cierre y la evidencia fotográfica a los que Perenco

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1024 Informe del Perito Independiente, primera viñeta después de la Tabla 5.1. [Traducción del Tribunal]

1025 Durante la audiencia, el Sr. MacDonald testificó: "Solo teníamos tres informes de cierre de piscinas de lodo; Coca 19, Jaguar 9 y el relleno sanitario Yuralpa. Eso lo miramos. Tienen imágenes. Tienen alguna descripción, están en español, pero entiendo español. José entiende más que yo. Y--pero, no obstante, los informes en ningún caso describían o mostraban algún tratamiento de materiales de piscinas de lodo fuera de las piscinas de lodo. Demuestran lo contrario. En dos de los tres sitios, las fotos muestran que los revestimientos están dañados y, en dos de los tres sitios, la Contratista de Perenco comparó los resultados de los ensayos de las piscinas de lodo, los criterios de desempeño aplicables a las piscinas no revestidas. Bien. Entonces, no se nos ha proporcionado registro o evidencia alguna de revestimientos competentes" [Traducción del Tribunal]. Tr. (1) (MacDonald) 81:2-8.

1026 Presentación Directa del Perito, Diapositiva 82. [Traducción del Tribunal]

remitió al Sr. MacDonald durante la Audiencia Pericial plantearon interrogantes en su mente. Testificó que en dos de los tres informes de taponamiento de piscinas que había podido revisar, si bien parecía que se habían colocado revestimientos de plástico, la propia Perenco había evaluado los contenidos de las piscinas en función de la Tabla 7(a) del RAOHE, que es más estricta, y no en función del estándar aplicable a las piscinas revestidas[1027]. Advirtió además que las fotos mostraban que una excavadora estaba operando dentro de la piscina (para mezclar el lodo) y opinó que esto pondría en peligro la integridad de cualquier revestimiento. Observó asimismo que había marcas de cavado al costado de las piscinas que indicaban que la excavadora estaba usando una pala con dientes que podían dañar cualquier revestimiento que se había puesto[1028].

850. Sin perjuicio del contrainterrogatorio del Sr. MacDonald por parte de Perenco sobre este punto, en vista de la ausencia de un protocolo escrito e informes de cierre de piscinas detallados, así como de la limitada evidencia fotográfica de prácticas de taponamiento, junto con la inspección de los sitios realizada por el Perito Independiente y su equipo, el Tribunal considera que el Sr. MacDonald tenía derecho a decidir que se aplicaran los estándares más estrictos. El Tribunal recuerda en este aspecto su instrucción previa: "En caso de duda, se aplica el estándar de mayor protección ambiental de la Tabla 7(a)"[1029]. Por lo tanto, el Tribunal no altera el enfoque del Perito Independiente.

(f) Muestreos de aguas subterráneas

851. El Perito Independiente recibió las siguientes instrucciones:

> "Respecto de las pruebas a las aguas subterráneas, el perito deberá realizar muestreos de aguas subterráneas de conformidad con la determinación del Tribunal de la norma técnica aplicable conforme a derecho ecuatoriano y las prácticas de la industria según lo establecido en esta Decisión. Su muestreo se limitará a los lugares de muestreo identificados por IEMS y GSI. Dado el transcurso del tiempo, podría ser necesario deslindar las

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1027 Presentación Directa del Perito, Diapositiva 79; Tr. (1) (MacDonald) (11 de marzo de 2019) 81:2-8, 19-21.

1028 Presentación Directa del Perito, Diapositiva 81; Tr. (1) (MacDonald) (11 de marzo de 2019) 81:22-82: 6.

1029 Decisión Provisional, párr. 611(16).

> responsabilidades de remediación entre Perenco y Petroamazonas. El Tribunal esperará el informe del perito en este sentido[1030]."

852. Entre el 13 de noviembre y el 14 de diciembre de 2017, Ramboll obtuvo muestras de 34 pozos de monitoreo permanentes instalados en 12 sitios. Las muestras fueron analizadas a fin de determinar la presencia de TPH y metales. Los resultados de los ensayos de laboratorio se exponen en la Tabla 5.2 del Informe. En síntesis, el Perito Independiente determinó lo siguiente:

> "Sobre la base de los resultados de los muestreos de Ramboll, las aguas subterráneas presentan contaminación por TPH por encima del estándar del TULAS en los 12 sitios investigados y en el 74% de los pozos de monitoreo que fueron objeto de muestreo. La concentración máxima de TPH observada fue de 1915 µg/L en Payamino 2/8, en comparación con el criterio del TULAS de 325 µg/L. Hay presencia de bario en el 58% de los sitios y en el 38% de los pozos que fueron objeto de muestreo. La concentración máxima de bario observada fue de 4700 µg/L en Gacela 1, en comparación con el criterio de 338 µg/L. No se identificaron otros contaminantes de relevancia en los pozos de monitoreo"[1031].

853. Ecuador no expresó críticas importantes respecto del trabajo del Perito Independiente en este aspecto[1032]. Perenco no parece insinuar que el Sr. MacDonald llevó a cabo muestreos en sitios que no fueron objeto de muestreo por parte de IEMS o GSI (aunque sí reconoció que, debido a consideraciones técnicas, se propusieron dos pozos [PAY01-MW03 y JAG02-MW-3] dentro de áreas con niveles elevados de contaminación del suelo)[1033].

854. Sin embargo, Perenco discrepó de la aplicación por parte del Sr. MacDonald de los criterios de aguas subterráneas establecidos en la Tabla 5 del TULAS a suelos con un contenido de arcilla superior al 25%, "aunque el TULAS excluye dichos suelos de estos criterios de

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1030 *Ibid.*, párr. 611(17).

1031 Informe Pericial Consolidado, tercera viñeta después de la Tabla 5.2. [Traducción del Tribunal]

1032 *Ibid.*, pág. 51: "Tal como MacDonald señala correctamente en la Sección 3.2.3 (en pág. 43), el RAOHE no precisa estándares numéricos de limpieza para las aguas subterráneas. Por ende, hizo lo que correspondía al proceder a comparar los Límites Máximos Permisibles aplicables a las aguas subterráneas en virtud del Libro VI, Anexo 1, Tabla 5 del TULAS con las concentraciones de bario, cadmio, cromo, cobre, plomo, níquel, zinc y TPH determinadas respecto de las aguas subterráneas. Esto es precisamente lo que hicieron IEMS y GSI como parte de sus investigaciones". [Traducción del Tribunal]

1033 E-453.

manera específica"[1034]. Perenco arguyó que, si un suelo tenía un contenido de arcilla superior al 25%, la regulación simplemente no era aplicable. Durante la Audiencia Pericial, el abogado de Perenco sometió al Sr. MacDonald a contrainterrogatorio sobre este punto y, durante la sesión de conferencia de peritos, también obtuvo un testimonio del Sr. Bianchi de GSI en este sentido[1035]. El Sr. MacDonald no coincidió con el Sr. Bianchi respecto de este punto[1036].

855. El Tribunal entiende ambos lados de este punto controvertido, y el resultado es una decisión más difícil de lo que fue para las cuestiones anteriores. Es extraño que la tabla especifique un porcentaje de arcilla, y, por esa razón, el argumento de Perenco es muy plausible. Pero el TULAS no establece que, si el contenido de arcilla del suelo es superior al 25%, no hay necesidad de investigar y/o remediar la presencia de contaminantes en las aguas subterráneas. En este sentido, el Tribunal comprende la lógica de la postura adoptada por el Perito Independiente.

856. Al final, el Tribunal ha decidido aceptar el enfoque del Sr. MacDonald por los dos siguientes motivos.

857. En primer lugar, la síntesis de los hallazgos de la investigación de las aguas subterráneas por parte del Perito Independiente (Tabla 5.2) describe la litología, en términos de porcentaje de arcilla, de cada sitio y muestra la variabilidad de dichos porcentajes en un

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1034 Informe Pericial Consolidado, pág. 58. [Traducción del Tribunal]

1035 Tr. (1) (MacDonald) (11de marzo de 2019) 269: 3-12 "algo que es muy claro en Ecuador, y no es tan diferente en otros países de la región, es que, cuando las regulaciones dicen algo, hay que ajustarse a esas regulaciones. Y si dice 25 por ciento de arcilla -no sé la palabra en inglés--"*fiscalizar*"-- no se puede ser regulado cuando no se está comprendido en la regulación. Simplemente no es aplicable. Entonces, en el caso en que la arcilla es superior al 25%, la regulación no es aplicable y dice eso. Es aplicable cuando es inferior al 25%" [Traducción del Tribunal]. Véanse también la presentación de clausura de Perenco, Tr. (2) (MacDonald) (12 de marzo de 2019) 433-434.

1036 Tr. (1) (MacDonald) (11 marzo de 2019) 269:13-270:4 "Esto es algo respecto de lo cual podríamos simplemente tener que disentir, lo que está bien. Pero, otra vez, no se nos--no se me impidió leer las regulaciones, interpretarlas ni mantener conversaciones con otros consultores en Ecuador, incluso con abogados en materia ambiental en la cual estuve indagando. No es distinto de la cuestión del TPH. El RAOHE, por ejemplo, deja muy en claro que hay absoluta libertad para sugerir un análisis alternativo en virtud de dichas regulaciones, e interpreto que el TULAS no es diferente. Entonces, una vez más, considero que tenemos una opinión diferente respecto de esto". [Traducción del Tribunal]

sitio. A modo de ejemplo, Mono 1, CPF registra un contenido de arcilla del 34,1% al norte de la plataforma, del 14,9% al noreste de la plataforma, del 38,8% al este de la plataforma en el área de descarga de lodos y del 18,2% al sur de la plataforma[1037]. El Tribunal considera sólido el argumento de Ecuador en virtud del cual el contenido de arcilla de los suelos puede variar, a veces considerablemente, en un sitio en particular y no tiene mucho sentido excluir la contaminación de aguas subterráneas que se presenta en los pozos perforados en suelos con un contenido de arcilla superior al 25% cuando hay pozos adyacentes perforados en suelos con un contenido de arcilla inferior al 25% que también presentan contaminación[1038]. El Tribunal comparte la preocupación de Ecuador por la posibilidad de que la variabilidad del contenido de arcilla derive en una remediación ineficaz si se aplica la "regla de corte" del 25% invocada.

858. En segundo lugar, y en relación con el argumento previo, el Sr. MacDonald indicó en la Audiencia Pericial, que los pozos permanentes instalados por Ramboll podían captar aguas subterráneas independientemente del contenido de arcilla del suelo[1039]. En sus propias palabras:

> "Hay evidencia de deterioro de las aguas subterráneas en todos los pozos. Cumplimos con la definición de agua subterránea. Ninguna disposición del TULAS establece que no hay obligación de remediación alguna si hay más de 25 por ciento de arcilla, por ejemplo. Entonces, eso es lo que hicimos"[1040].

1037 Informe Pericial Consolidado, Tabla 5.2, pág. 99.

1038 Tr. (2) (MacDonald) (12 de marzo de 2019) 403:7-19.

1039 Tr. (1) (MacDonald) (11 de marzo de 2019) 70: 14-18: "el agua con que se encontró Ramboll en todos los lugares de muestreo cumple con la definición de 'agua subterránea' del TULAS, 'agua del suelo subsuperficiales que se encuentra ubicada en la zona de saturación donde todo el espacio poroso se llena de agua a la presión atmosférica o por encima de ella'". [Traducción del Tribunal]

1040 Tr. (1) (MacDonald) (11 de marzo de 2019) 71: 14-19. En respuesta al alegato de Perenco de que las muestras de aguas subterráneas habían sido malinterpretadas y los cromatogramas efectivamente mostraban cera vegetal, el Perito observó: "…respecto de los pozos donde se creía que no—que los hallazgos no reflejaban petróleo, en todos y cada uno de los pozos en que las aguas subterráneas habían cambiado, había olores, en algunos casos, advertimos gotas de petróleo, mientras que, en otros casos, había crudo intemperizado en las áreas donde pusimos los pozos de monitoreo" [Traducción del Tribunal]. Tr. (1) (MacDonald) (11 de marzo de 2019) 77: 17-22. [Traducción del Tribunal]

859. El Tribunal entiende a partir de su testimonio que el TULAS impone estándares de protección de aguas subterráneas, y no de arcilla, y si el agua extraída de un pozo (independientemente del porcentaje de contenido de arcilla del suelo del cual se extrajo el agua subterránea) está contaminada, los estándares del TULAS serían aplicables[1041].

860. Por lo tanto, el Tribunal no altera el enfoque del Perito Independiente[1042].

(g) que al momento de estimar los costos de cualquier remediación de la que Perenco fuere responsable "debería regirse por los costos ecuatorianos"?

861. Perenco afirmó que, en contravención de las instrucciones del Tribunal, los costos unitarios de remediación de Ramboll no reflejan los costos locales[1043]. Se quejó de que Ramboll nunca proporcionó copias de sus cotizaciones para que las Partes las verificaran[1044], sino que, en su lugar, generó sus cifras de remediación del suelo a través de una base de datos (la base de datos "RACER") desarrollada en los Estados Unidos[1045]. Perenco arguyó que estas cifras superaban considerablemente los costos unitarios de GSI, que se habían basado en el rango superior de los costos locales reales[1046].

862. Perenco también aseveró que las dos cotizaciones de Ramboll preparadas por dos contratistas locales, Hidrogeocol Ecuador y Ecuambiente, se obtuvieron en forma extemporánea mientras el Perito Independiente finalizaba su informe y no constituían guías fiables. El costo unitario de Hidrogeocol en concepto de transporte y tratamiento de suelos contaminados con presencia de TPH y metales pesados ascendía a USD 260/m³, seis veces más que el costo unitario real de Petroamazonas de USD 39/m³ por trabajo de remediación

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1041 Presentación Directa, Diapositiva 64; Tr. (1) (MacDonald) (11 de marzo de 2019) 70-71.

1042 Tal como se destacara anteriormente, se alegó que las muestras de aguas subterráneas del Perito eran claramente diferentes de los resultados obtenidos por IEMS y GSI, pero el Sr. MacDonald, en la Diapositiva 68 de su Presentación Directa, señaló lo siguiente: "Ni IEMS ni GSI han puesto sus datos a disposición ni proporcionado detalles; por ende, no puedo realizar comentarios acerca de lo que se describe como resultados notablemente diferentes". [Traducción del Tribunal]

1043 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 65 y nota al pie 137; Presentación de Clausura de Perenco, pág. 45.

1044 *Ibid.*, párr. 66.

1045 Presentación de Cierre de Perenco, pág. 48, que hace referencia a la declaración testimonial del Sr. MacDonald en Tr. (1) (MacDonald) (11 de marzo de 2019) 87(21)-88:5.

1046 Tr. (2) (MacDonald) (12 de marzo de 2019) 504:3-21; Presentación de Refutación de Perenco, pág. 2.

similar[1047]. En el mismo sentido, el costo unitario de Ecuambiente en concepto de transporte y tratamiento de suelos con presencia de solo TPH ascendía a USD 56/m³, en tanto que el costo unitario real de Petroamazonas era de USD 46/m³ por trabajo de remediación similar[1048]. En opinión de Perenco, el Perito Independiente no pareciera haber obtenido variedad de cotizaciones de otros contratistas ni haber tenido en cuenta el hecho de que las cotizaciones proporcionadas a sociedades extranjeras —especialmente en el contexto de un litigio— son típicamente más altas[1049].

863. Perenco sostuvo, por consiguiente, que el Tribunal debería aplicar los costos reales en los que incurrió recientemente Petroamazonas, que constituyen la "mejor guía para la estimación de trabajos de remediación similares"[1050]. Estos surgían de los propios documentos públicos de Petroamazonas y mostraban, conforme alega Perenco, que los trabajos de remediación en los Bloques 7 y 21 fueron considerablemente inferiores a las estimaciones de Ramboll, por ejemplo, USD 39/m³ por el tratamiento y la eliminación de suelos con presencia de TPH y metales, en comparación con la estimación de USD 160/m³ de Ramboll[1051].

864. En síntesis, la crítica de Perenco al enfoque del Perito Independiente respecto de los costos unitarios era que, si bien Ramboll decía que la base de datos RACER se utilizó solo como referencia[1052], en realidad, se había basado en las estimaciones de RACER, y no en las cotizaciones locales obtenidas en forma extemporánea de Hidrogeocol o Ecuambiente (que también eran exageradas en vista del contexto de un litigio) ni en los costos de

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1047 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 70, que contrastan el Informe del Perito Independiente, Apéndice 19.C con CE-CC-451.

1048 *Id.*

1049 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 70.

1050 *Ibid.*, párr. 72, que hace referencia a la Decisión Provisional, párr. 579. [Traducción del Tribunal]

1051 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 69, que contrastan el Informe del Perito Independiente, Apéndice 19.C y Apéndice 19.B con CE-CC-451.

1052 Presentación de Clausura de Perenco, Diapositiva 49.

Petroamazonas, lo que era más apropiado, tal como demuestran los documentos que se encuentran a disposición del público[1053].

865. El Tribunal considera de utilidad exponer la explicación por parte del Sr. MacDonald del "proceso de licitación" de costos de Ramboll[1054]. La primera parte de su explicación hacía referencia a diversas críticas de Perenco y las abordaba de a una por vez:

> Solicitud extemporánea de cotizaciones[1055]: "Entonces, una aquí es que, en apariencia, recibimos las cotizaciones a fines de noviembre y en diciembre [de 2018]. … pero la cotización real – lo que llamaremos 'proceso de solicitud', comenzó mucho antes en el año.
>
> La que figuraba en el Informe Pericial era simplemente la comunicación más reciente que tuvimos. No debía sugerir que esa fue la fecha en que obtuvimos algo de información y la recopilamos toda en el plazo de dos semanas. … Por ende, nuestro proceso de solicitud comenzó, en realidad, en el primer trimestre de 2018 y, nuevamente, las cotizaciones de diciembre no son más que las últimas versiones luego de muchas revisiones y aclaraciones entre personas a las que recurrimos en Ecuador.
>
> Muy pocas cotizaciones: Ramboll no pareciera haber obtenido variedad de cotizaciones de otros contratistas. En efecto, eso no es cierto. Se solicitaron cotizaciones o información de costos a siete contratistas en Ecuador que, en realidad, fueron 11. A cuatro no les interesó. Pero hubo comunicaciones con varios y, en un minuto, explicaré cómo lo hicimos, teniendo en cuenta el hecho de que las cotizaciones proporcionadas a sociedades extranjeras son más altas"[1056].

866. El Sr. MacDonald luego analizó los recaudos que tomó Ramboll en un intento de asegurarse de que no se proporcionaran cotizaciones más altas debido a su carácter de sociedad extranjera o porque las cotizaciones se iban a utilizar en el contexto de un litigio y, por lo tanto, podían estar infladas:

> "… recurrimos a una consultora en Ecuador, Hidrogeocol. … son consultores y supervisan trabajos de remediación y creímos que el hecho

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1053 *Id.*

1054 Tr. (1) (MacDonald) (11 de marzo de 2019) 84:18. [Traducción del Tribunal]

1055 En aras de facilitar la lectura, el Tribunal ha insertado títulos en este fragmento de la transcripción.

1056 Tr. ((1) (MacDonald) 11 de marzo de 2019) 84:14-15, 17-19, 85:1, 4-18. [Traducción del Tribunal]

> de que ellos preguntaran ciertas cosas sería más rápido, más eficaz que si lo hiciéramos nosotros porque son locales.
>
> Ellos se conocen y consideramos que, en general, fue así.
>
> Lo otro es que, como se sabe, estas cotizaciones, en el contexto de un litigio, son típicamente más altas. Le exigimos a Hidrogeocol que firmara un acuerdo de no divulgación, de manera que los detalles del Proyecto, identidad de los, quiero decir--seguro, la gente sabe lo que está pasando en el Amazonas oriental, seguro, en cierta medida, pero nos ocupamos de esto solo mediante este factor.
>
> Entonces, él hablaba con ellos a nivel local, no en el contexto de un litigio, ni en el contexto de una entidad estadounidense propiamente dicha, a fin de intentar obtener la información más fidedigna posible. Y, bueno, así fue--fue un proceso repetitivo y, con el tiempo, efectivamente los incorporamos en nuestra estimación de los costos de remediación"[1057]. [Énfasis agregado]

867. El Sr. MacDonald posteriormente explicó cómo se utilizó la base de datos RACER en el proceso de estimación de costos de Ramboll:

> "Usamos RACER. RACER es una base de datos que contiene información acerca de muchos, muchos proyectos, más o menos 1500, de distintos lugares del mundo.
>
> Y la idea en realidad--para la divulgación plena, la Fuerza Aérea de los EE. UU. desarrolló esta base de datos… Y con el tiempo se convirtió en una base de datos global, que contiene información de proyectos similares de otras compañías. Y utilizamos RACER como una especie de prueba de fuego, de recurso de confirmación, y, en particular, cuando hay variaciones entre los costos de contratistas locales, los únicos costos que tenían algún componente de--lo llamaré 'pensamiento RACER' se referían al tratamiento, al transporte y a la eliminación de suelos. …
>
> En concreto, y eso fue porque hemos advertido una amplia gama de costos provenientes de Ecuador y queríamos ver cómo se sentía, es decir, lucía en el contexto de RACER como una especie de prueba de fuego, y muchos piensan que las estimaciones dentro de RACER con frecuencia se encuentran dentro del 10 por ciento de los costos de remediación reales.
>
> Ahora bien, no digo que eso sea cierto en todos y cada uno de los casos, pero se refiere a las experiencias reales que las compañías han tenido en

[1057] *Ibid.*, 85:20-21, 86:2-21. [Traducción del Tribunal]

> distintos lugares del mundo; entonces, ¿por qué no tenerla en cuenta? Era una referencia complementaria, pero la mayoría de nuestros costos o todos ellos surgieron de este proceso repetitivo de obtener los precios de costo unitario reales de contratistas locales en Ecuador" . [1058] [Énfasis agregado]

868. En vista de las explicaciones precedentes, el Tribunal acepta que lo que, a partir de la lectura del Informe Pericial, a simple vista, parecía ser un esfuerzo de último minuto por encontrar algunas estimaciones de costos de remediación era de hecho la culminación de un proceso más deliberado que se había extendido durante aproximadamente 8 meses con la intermediación de una firma ecuatoriana local sujeta a obligaciones de no divulgación. Acepta además la opinión del Sr. MacDonald de que el "uso de RACER no desmiente el hecho de que los costos [de Ramboll] están muy orientados a Ecuador"[1059] y de que RACER se empleó como "herramienta confirmatoria"[1060]. El Tribunal observa que Perenco ha argüido que los costos estimados por Ramboll eran superiores a las cifras proporcionadas en la cotización de Ecuambiente[1061], aunque, tal como declaró el Sr. MacDonald, los precios unitarios que recibió Ramboll "provenían de Ecuador"[1062], pero eran muy bajos para el plan conceptual de remediación que desarrollaron él y su equipo y, por lo tanto, las estimaciones se ajustaron hacia arriba[1063]. El Tribunal acepta que se trata de un ejercicio apropiado del criterio profesional del Sr. MacDonald.

869. Por último, con respecto a su argumento de que el Tribunal debería aplicar los costos de Petroamazonas, Perenco invocó el contrato de gestión de desechos Incinerox 2018 de Petroamazonas (y una declaración contenida en su oferta de bonos de 2017 a partir de la cual Perenco calculó el costo de la remediación que había llevado a cabo Petroamazonas) y afirmó que estos son precios válidos dado que fueron obtenidos mediante "un proceso abierto de propuesta y licitación"[1064] que es "una buena manera de conseguir precios

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1058 *Ibid.*, 87:1-88:5. [Traducción del Tribunal]

1059 *Ibid.*, 205:1-2.

1060 *Ibid.*, 204:16-17. [Traducción del Tribunal]

1061 Véase Alegato de Clausura de Perenco, pág. 46.

1062 Tr. (1) (MacDonald) (11 de marzo de 2019) 202:10. [Traducción del Tribunal]

1063 *Ibid.*, 203:21-22; 209:21-210:2.

1064 Tr. (2) (MacDonald) (12 de marzo de 2019) 504:20-21.

bajos"[1065]. En su alegato de clausura, Perenco destacó el siguiente texto de estos documentos:

> Contrato de Petroamazonas de 2018
> "Cláusula Quinta: Alcance de los Trabajos.
> 5.3 - Tratamiento y/o disposición final de los residuos evacuados, debiendo, para el efecto, cumplir con los requisitos legales ambientales aplicables a gestores de residuos y toda la normativa ambiental vigentes [sic] aplicable"[1066].
>
> Oferta de Bonos 2017 de Petroamazonas
> "El 1 de julio de 2013, el directorio de Petroamazonas estableció el Proyecto Amazonia Viva, que fue posteriormente aprobado por el Ministerio de Ambiente el 3 de junio de 2014. El objetivo de este proyecto consiste en eliminar fuentes de contaminación y remediar suelos contaminados, como resultado de actividades de exploración y producción de fecha anterior a las propias operaciones de Petroamazonas. En la actualidad, el proyecto comprende esfuerzos de eliminación y remediación en los bloques de exploración 11 (Bermejo), 56 (Lago Agrio), 57 (Shushufindi Libertador), 58 (Cuyabeno), 60 (Sacha) y 61 (Auca), que se llevan adelante de conformidad con la Política Pública de Reparación Integral y la normativa ambiental existente, bajo la supervisión y el monitoreo del Ministerio de Ambiente. Durante el período finalizado el 31 de diciembre de 2016, se remediaron aproximadamente 364.240 metros cúbicos de suelo y se eliminaron 191 fuentes de contaminación como parte del Proyecto Amazonia Viva. En consecuencia, Petroamazonas pudo recuperar aproximadamente 4.959 barriles de petróleo crudo durante el período 2016. A la fecha, Petroamazonas ha remediado aproximadamente 732.956 metros cúbicos de suelo y eliminado 520 fuentes de contaminación desde la implementación del Proyecto Amazonia Viva en el año 2014.
>
> En 2016, Petroamazonas incurrió en gastos de aproximadamente USD 23,1 millones para la implementación del Proyecto Amazonia Viva. En 2017, Petroamazonas cuenta con un presupuesto anual de USD 26,6 millones para dicho proyecto. Al mes de octubre de 2017, Petroamazonas ha invertido aproximadamente USD 19,4 millones en este proyecto"[1067]. [Énfasis de Perenco]

1065 *Ibid.*, [Traducción del Tribunal]

1066 CE-CC-451, Sección 5.3; véase Presentación de Clausura de Perenco, pág. 53.

1067 CE-CC-446, pág. 86; véase Presentación de Clausura de Perenco, pág. 56. [Traducción del Tribunal]

870. El Tribunal ha considerado minuciosamente la cuestión del contrato Incinerox, en particular, porque se relaciona con los propios esfuerzos de remediación de Petroamazonas en los Bloques y, por ende, parece ser de gran relevancia.

871. En la Audiencia Pericial, el Sr. MacDonald señaló que había "variabilidad considerable" [Traducción del Tribunal] en los costos unitarios proporcionados a Petroamazonas. Por ejemplo, mientras que Perenco apuntó a un contratista que evidentemente prestaba servicios de remediación de suelos por presencia de TPH y metales a un costo de USD 39,06/m^3, otro contrato de Petroamazonas tenía un precio de USD 455,88/m^3, *unas 12 veces más alto*, en concepto de servicios de remediación[1068]. El Sr. MacDonald también advirtió que el alcance de los documentos contractuales Incinerox no identificaba las tecnologías de remediación específicas que se emplearían. Por lo tanto, era escéptico ante la insinuación de que efectivamente había verdadera similitud entre los servicios del contrato Incinerox y lo que él contemplaba que debía hacerse:

> …Hemos visto un par de estas solicitudes de propuestas (*RFP*, por sus siglas en inglés). Cito dos de ellas aquí, para remediación de suelos con presencia de petróleo y metales, de USD 39 por metro cúbico a USD 455 por metro cúbico. Nuestro precio por unidad era de USD 160, USD 150-160 por metro cúbico. Y--pero el alcance de los documentos contractuales de Petroamazonas no identificaba tecnologías de remediación específicas. Entonces, es necesario saber más a fin de determinar si existe una comparación válida.
> Y no significa que nuestro precio de costo unitario sea irrazonable. Creemos que no lo es"[1069]. [Énfasis agregado]

Y

> "no queda claro específicamente si algunos tratamientos contemplaban qué incluyen estos costos y dónde. Por consiguiente, creo que estamos muy seguros del precio unitario que hemos desarrollado para el tratamiento, el transporte y la disposición. Lo que también resulta claro en Ecuador es que los tipos de materiales y la contaminación en estos sitios requieren tratamiento. No se trata de excavar, transportar y disponer directamente. Por lo tanto, hay un componente de tratamiento, y eso debe entenderse y aclararse cuidadosamente. Y al menos desde mi mirada inicial de esto, no quedaba totalmente claro si el tratamiento estaba contemplado o no"[1070]. [Énfasis agregado]

1068 Presentación Directa del Perito, Diapositiva 91.

1069 Tr. (1) (MacDonald) (11 de marzo de 2019) 90:3-13. [Traducción del Tribunal]

1070 *Ibid* 245:12-246:3; véanse también Alegato de Clausura de Ecuador, pág. 23. [Traducción del Tribunal]

872. El Tribunal comparte las dudas del Perito Independiente de que los servicios contemplados por el contrato entre Incinerox y Petroamazonas sean similares en alcance y sofisticación a lo que se necesita para implementar su plan de remediación.

873. El Tribunal resalta asimismo la preocupación del Sr. MacDonald por la posibilidad de que el proceso de subasta inversa empleado por Petroamazonas sirva para bajar los costos, pero "no garantice que esto no afecte… la calidad del trabajo"[1071]. La propia Perenco se refirió a esto en su alegato de clausura y, según el Tribunal, es un punto importante[1072].

874. Además, el Sr. MacDonald consideraba que no podía suponerse que los costos de Petroamazonas reflejaran los costos locales en general. Declaró en este sentido en la audiencia:

> "Ahora bien, así es la cosa con Petroamazonas, y sí, hacen una parte de su propio trabajo de remediación, ¿verdad? Si se trata de derrames, emisiones, otras cosas, y lo hacen ellos mismos; … entonces, ellos mismos podrían ofrecer cosas, tales como seguridad y relaciones con la comunidad, áreas para el almacenamiento de equipos, toda la infraestructura y los materiales tomados prestados y, digo, varias otras cosas que podrían incluirse en un proyecto de remediación, pero eso no es lo mismo que la posibilidad de que un tercero lleve a cabo un trabajo de remediación en representación de una parte responsable.
>
> Por ende, no hay fundamento alguno para que asumamos en esta etapa que, si se hace algún trabajo de remediación, lo hace Petroamazonas. No lo sé, por oposición a un tercero contratista. Y lo sospecho --pero, nuevamente, no lo sé, pero tendrían que ser recursos muy dedicados, por lo cual no entendí aquí que fuera nuestro trabajo tratar de perjudicar nuestros costos suponiendo que Petroamazonas llevaría a cabo algún trabajo de remediación al final por oposición a un tercero…[1073]. [Énfasis agregado]

1071 Tr. (1) (MacDonald) (11 de marzo de 2019) 284:6-11. [Traducción del Tribunal]

1072 Tr. (2) (MacDonald) (12 de marzo de 2019) 505:1-4: El proceso de subasta inversa, "tal como reconoce el Sr. MacDonald, es una buena manera de conseguir precios bajos, aunque no le gusta que pueda tener consecuencias negativas si los proveedores no cumplen con sus obligaciones" [Traducción del Tribunal].

1073 Tr. (1) (MacDonald) (11 de marzo de 2019) 89:2-90:1. [Traducción del Tribunal]

875. En definitiva, el Tribunal está convencido de que los costos del Sr. MacDonald son utilizables, razonables y consistentes con la indicación del Tribunal de que se empleen costos unitarios locales.

4. Cuantificación del Tribunal de la indemnización por daños que debería sufragar Perenco

876. Luego de haber reflexionado sobre la prueba y los escritos de las Partes, el Tribunal comenzó por tratar de centrarse en los "hechos conocidos" de la contaminación identificada por el Perito Independiente [Traducción del Tribunal]. Se abordó en primer lugar la contaminación relacionada con las piscinas de lodo y los pozos de Perenco. En lo que se refiere a las demás formas de contaminación, el Tribunal se concentró en lo siguiente: (i) el tipo de contaminación; (ii) dónde se ubicaba la contaminación; (iii) si las sustancias detectadas se encontraban relacionadas con las operaciones de perforación o con las operaciones hidrocarburíferas en curso; (iv) si alguno de los pozos en los que se halló contaminación fue perforado por Perenco; (v) durante cuánto tiempo se había utilizado una plataforma antes de que Perenco apareciera en escena; (vi) si existían pruebas obrantes en el expediente que evidenciaran derrames o contaminación de otra índole con anterioridad a la operación de Perenco o durante ella; y (vii) si, en el caso de contaminación de las aguas subterráneas, el pozo de monitoreo de aguas subterráneas en el cual se detectó la contaminación se hallaba próximo a la contaminación o a la característica de un sitio (por ejemplo, piscina de lodo, piscina de aguas de formación) que ya hubiera sido atribuida a una predecesora o a Perenco[1074]. El Tribunal también tomó nota de las instancias en la cuales Perenco aceptó su responsabilidad parcial o plena por la contaminación en un sitio o área particular de un sitio.

877. Si se trataba de un sitio contaminado por bario y el pozo había sido perforado por una predecesora de Perenco, el Tribunal decidió que esa contaminación no debía atribuirse a Perenco. Por ejemplo, Lobo 01 fue perforado en el mes de febrero de 1989; el 100% de los

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[1074] Parte de la contaminación de las aguas subterráneas se atribuyó a una fuente probable (por ejemplo, una piscina de lodo). Si resultó no atribuible a Perenco, todas las responsabilidades de remediación se adjudicaron a la(s) predecesora(s) (por ejemplo, Coca-2-MW1), y si resultó atribuible a Perenco, todas las responsabilidades de remediación se adjudicaron a Perenco (por ejemplo, Oso 9).

costos de remediación (USD 1,361 millones) se asignó al 'ámbito de responsabilidad de las predecesoras de Perenco'. [Traducción del Tribunal]

878. Por el contrario, si un incidente de contaminación se encontraba indudablemente ligado a las operaciones de Perenco (siendo los principales ejemplos los pozos perforados por Perenco y las piscinas de lodo), o si se trataba de un incidente por el cual Perenco aceptó responsabilidad parcial o plena (por ejemplo, Mono CPF, donde Perenco aceptó responsabilidad por "algunos costos" de un derrame de petróleo ocurrido en el año 2008[1075]), los costos de remediación estimados en relación con dicho incidente se incluyeron en 'el ámbito de responsabilidad de Perenco' [Traducción del Tribunal]. Por ejemplo, los pozos de producción de Jaguar 9 fueron perforados por Perenco en julio 2004. La suma de USD 541.000 en concepto de remediación del suelo determinada por el Perito Independiente se adjudicó exclusivamente al ámbito de responsabilidad de Perenco.

879. De manera similar, las piscinas de lodo en Oso 9, 10-12, 15-20 dan origen a un costo de remediación en la suma de USD 5.317.000 y un costo de remediación de las aguas subterráneas en la suma de USD 3.415.000. Ambos fueron adjudicados a Perenco. El Tribunal consideró en este sentido que era probable que el deterioro de las aguas subterráneas en las áreas adyacentes a las piscinas de lodo o a las antiguas piscinas de aguas de formación estuviera relacionado con esas estructuras y, por lo tanto se lo atribuyó a las entidades que las construyeron o las utilizaron[1076]. (El Tribunal consideró asimismo que en algunos casos no podía descontar los aportes de Petroamazonas al deterioro de las aguas subterráneas (por ejemplo, el separador API en Coca 2/CPF, Gacela 1/CPF y Payamino 1/CPF). Por lo tanto, para los costos de remediación del deterioro de las aguas subterráneas, el Tribunal no solo adjudicó los costos entre Perenco y sus predecesoras, sino que incluyó asimismo a Petroamazonas en la adjudicación ponderada en el tiempo).

1075 Anexo 1 de los Comentarios de Perenco sobre el Informe del Perito Independiente de 22 de febrero de 2019, pág. 15.

1076 Un ejemplo en contrario es Coca 2. El deterioro al norte de la piscina de aguas de formación y al oeste de la piscina de lodo se atribuyó exclusivamente a las predecesoras.

880. Tal como se observara en el párrafo [877] *supra*, el Tribunal consideró también el tipo de contaminante. Se relacionó al bario con la perforación de los pozos y ello permitió al Tribunal asignar los excesos de bario a la categoría del operador de la perforación (concretamente, Perenco o sus predecesoras). Cuando el medio ambiental se vio afectado por TPH, el Tribunal consideró que ello fue el resultado de una emisión operativa de petróleo crudo. Estas emisiones operativas pudieron ocurrir antes, durante, o después de la operación por parte de Perenco.

881. Por lo tanto, para determinadas cuestiones, en particular, en los ámbitos de contaminación del suelo y de las aguas subterráneas, se empleó también el método de atribución de responsabilidad con base en el tiempo. Dado que la contaminación puede ocurrir a partir de accidentes operativos en curso y combinarse con la contaminación ocasionada por operadores anteriores, la atribución de responsabilidad con base en el tiempo de las operaciones constituye, desde la perspectiva del Tribunal, un método apropiado para hacer frente a la falta de certeza.

882. Como resultado de este ejercicio, el Tribunal consideró que la responsabilidad podría recaer dentro de cinco combinaciones de personas:

(i) Instancias en las cuales la contaminación identificada por el Perito Independiente resultó atribuible solamente a las predecesoras de Perenco (por ejemplo, en sitios en los cuales los excesos de bario únicamente o combinado con otros metales se relacionaron con la perforación de los pozos llevada a cabo por un operador anterior);

(ii) instancias en las cuales la contaminación fue atribuible a Perenco (por ejemplo cuando los excesos de bario únicamente o combinado con otros metales se relacionaron con la perforación de los pozos por parte de Perenco o en el caso de las piscinas de lodo de Perenco);

(iii) instancias en las cuales la contaminación fue atribuible a Perenco, sus predecesoras y su sucesora (por ejemplo, cuando cada una utilizó una estructura operativa particular (por ejemplo, un separador API) en un sitio en el que se determinó un deterioro de las aguas subterráneas);

(iv) instancias en las cuales la contaminación fue atribuible a Perenco y a sus predecesoras, aunque no a Petroamazonas (debido a las limitaciones en el muestreo del Perito Independiente discutidas previamente que redujeron las posibilidades de que se hallara contaminación post-Perenco); e

(v) instancias en las cuales la contaminación fue atribuible a Perenco y a Petroamazonas (debido a que el sitio fue desarrollado por Perenco y Petroamazonas continuó las operaciones allí).

883. En las últimas tres combinaciones, en algunas instancias, el Tribunal adjudicó los costos de remediación entre Perenco y la otra parte o partes con base en la prueba obrante en el expediente del momento de la perforación del pozo y/o la construcción o utilización de la piscina de lodo, de los derrames u otros incidentes, y tomando en consideración la asunción de responsabilidad expresa por parte de Perenco (aunque sin encontrarse obligado por ninguna limitación allí contenida). En otros casos, se empleó el enfoque de ponderación en el tiempo cuando la evidencia documentada pudo ser utilizado para diferenciar entre las actividades de las Predecesoras de Perenco y las de Perenco.

884. Por ejemplo, en lo que respecta a Jaguar 01, que fue perforado desde el mes de noviembre de 1987 hasta el mes de enero de 1988 y que fue operado por predecesoras de Perenco antes de que Perenco apareciera en escena, en el Anexo 1 a los comentarios de Perenco sobre el Informe Pericial, Perenco asumió responsabilidad por "algunos costos" [Traducción del Tribunal] de remediación del suelo y de las aguas subterráneas[1077]. El Tribunal ha atribuido a Perenco la responsabilidad por el impacto de la contaminación de TPH en torno a la estación de purga, que ha resultado de un derrame de petróleo que fuera informado en los años 2005-06, así como una responsabilidad parcial por la zona pantanosa pendiente abajo de la estación de purga. En este caso, el Tribunal ha adjudicado USD 1.997.000 a las predecesoras de Perenco y USD 1.107.000 a Perenco. (La última cifra no incluye la suma de USD 438.000 en concepto de remediación de TPH detectado en aguas subterráneas que el Tribunal atribuye a una emisión ocurrida en los años 2005/06 durante la operación de Perenco.)

885. De manera similar, en Jaguar 02, perforado en el mes de enero de 1994 y que quedara fuera de servicio en el año 2000, y, por ende, solo operado por las predecesoras de Perenco, había una piscina de lodo preexistente que no pertenecía a Perenco que sufrió un derrumbe del

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[1077] Anexo1 a los Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, págs. 2 y 5 (con base en los Costos Estimados de Ramboll).

talud. Esto no resultó atribuido a Perenco. La contaminación en las zonas afectadas con bario y otros metales al nordeste de la plataforma, al oeste de la piscina de lodo, y a lo largo del tendido septentrional también se atribuyó a las predecesoras de Perenco. Se consideró a Perenco exclusivamente responsable del crudo superficial resultante del derrame ocurrido en el año 2006. En el Anexo 1 a los comentarios de Perenco sobre el Informe, Perenco asumió responsabilidad por "algunos costos" relacionados con la remediación del suelo debido a un derrame de petróleo "de fecha desconocida" y "algunos costos" en concepto de remediación de las aguas subterráneas[1078]. En el resultado, una pequeña parte de la responsabilidad fue adjudicada a Perenco (USD 196.000 para Perenco contra USD 8.308.000 a sus predecesoras).

886. En los casos de probable estratificación de la contaminación por operadores sucesivos, el Tribunal empleó una distribución de los costos de remediación basada en el tiempo, con base en la duración de la operación por parte de Perenco como porcentaje de (i) las operaciones de sus predecesoras, (ii) la operación de Petroamazonas, o (iii) ambas. El marco temporal seleccionado para adjudicar la responsabilidad entre Perenco y sus predecesoras supuso que las emisiones al medioambiente comenzaron en el momento de la instalación del primer pozo de producción y continuaron hasta el mes de julio de 2009. Para aquellas zonas afectadas que pudieran atribuirse a operaciones de la CPF, se supuso que la emisión inicial había ocurrido cuando se construyó la CPF. En este sentido, la adjudicación de responsabilidad a Perenco resulta conservadora, en tanto no considera la posibilidad de fechas de contaminación ulteriores y el hecho de que no todos los yacimientos petrolíferos fueron explotados en forma activa por operadores anteriores después de la instalación del primer pozo de producción.

887. La responsabilidad compartida ponderada en el tiempo se utilizó para la contaminación del suelo (cuando no pudo utilizarse el expediente probatorio en la distribución de costos, tal como se observara en el párrafo 881 *supra*), y para el deterioro de aguas subterráneas. Por ejemplo, en lo que respecta a Gacela 02/CPF, para el deterioro de las aguas subterráneas aguas abajo del separador API, el Tribunal consideró apropiado adjudicar parte de la

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1078 *Ibid.*, pág. 2. [Traducción del Tribunal]

responsabilidad a Petroamazonas debido a su utilización continua del separador. Para el deterioro de las aguas subterráneas al sudeste de la instalación, las muestras de suelo se recolectaron poco tiempo después de que la tenencia de Perenco llegara a su fin, y la responsabilidad por dicho deterioro se adjudica entre Perenco y sus predecesoras. En consecuencia, a Perenco se le adjudicaron USD 452.530 en concepto de costos de remediación, a sus predecesoras se les adjudicaron USD 458.990, y a Petroamazonas se le adjudicaron USD 485.480 en concepto de costos de remediación.

888. La metodología adoptada por el Tribunal, tal como se ha descrito, se había aplicado a cada sitio, y los resultados de este proceso son expuestos en el Anexo A de este Laudo, el cual presenta las conclusiones del Tribunal en forma de tablas para (i) sitios donde Perenco utilizó piscinas de lodo y / o instaló pozos de producción de petróleo crudo; (ii) sitios donde la responsabilidad por la remediación del suelo está distribuida entre los operadores anteriores y Perenco; (iii) sitios de aguas subterráneas donde la responsabilidad está asignada entre los operadores anteriores, Perenco, y el sucesor de Perenco; y (iv) ciertos otros sitios que el Tribunal ha aceptado dan lugar a responsabilidad por parte de Perenco.

889. En aplicación de los criterios que anteceden, las responsabilidades de remediación que estimara el Sr. MacDonald en el Informe se distribuyeron de la siguiente manera (con anterioridad a otros ajustes):

A. Piscinas de lodo y pozos instalados por Perenco

El estimado de remediación total de **USD 50.017.000** se relaciona con aquellos sitios en los que Perenco utilizó piscinas de lodo o instaló pozos de producción: De esta suma,

USD 49.604.320 resultan atribuidos a Perenco,

USD 114.080 resultan atribuibles a las predecesoras de Perenco, y

USD 298.600 resultan atribuibles a la sucesora de Perenco.

B. Otra remediación del suelo

Para aquellos sitios operados por Perenco en los que no utilizó piscinas de lodo ni instaló pozos de producción, los costos totales de remediación de los suelos ascienden a la suma de **USD 88.538.000**. De esta suma:

En aplicación del método de distribución con base en el tiempo, **USD 27.522.810** resultan atribuidos a Perenco, y

USD 61.015.190 resultan atribuibles a las predecesoras de Perenco.

C. Aguas subterráneas

Los costos totales de remediación de las aguas subterráneas ascienden a la suma de **USD 21.326.000**. De esta suma:

En aplicación del método de distribución con base en el tiempo, **USD 8.856.760** resultan atribuibles a Perenco:

USD 11.250.680 resultan atribuibles a las predecesoras de Perenco, y

USD 1.218.550 resultan atribuibles a la sucesora de Perenco.

El total atribuido a Perenco antes de ajustes asciende a la suma de **USD 85.938.890**.

D. Ajuste

El Tribunal ha determinado que debe realizar un ajuste de esta cifra al alza para dar cuenta de determinados sitios identificados por Ecuador que el Perito Independiente pasó por alto o no pudo muestrear. Por lo tanto ha adicionado la suma de USD 7,.7 millones en concepto de remediación de las piscinas de lodo en Payamino 16 y Yuralpa B, y la remediación de las aguas subterráneas en el relleno de Yuralpa.

Esto eleva la suma a un total de **USD 93.638.890**.

5. Efecto del laudo *Burlington*

890. El Tribunal procede a tratar la cuestión que consiste en determinar de qué manera abordar el laudo *Burlington*. Se recordará que ese tribunal delegó en el presente Tribunal la tarea de resolver la cuestión de la posible doble recuperación de daños[1079].

[1079] El tribunal observó en el párr. 1086 de su Decisión sobre Reconvención lo siguiente: "A la fecha de la presente Decisión, el tribunal de Perenco no ha emitido aun decisión alguna sobre las reconvenciones ante sí. Por lo tanto, el presente Tribunal carece de la información o del fundamento necesarios para adoptar medidas específicas – para dar forma a su decisión, tomando prestada la frase de Ecuador – a fin de evitar la doble recuperación, una tarea que deberá delegar en el tribunal de Perenco en tanto es quien está decidiendo en segundo lugar. Dicho esto, este Tribunal afirma sin embargo que, como una cuestión de principio, la

891. En la última fase del presente procedimiento Ecuador no ha controvertido que existe una superposición territorial sustancial entre la contaminación pasible de remediación según las estimaciones del Sr. MacDonald y aquella estimada por el tribunal de *Burlington*[1080]. Sin embargo, resulta evidente que el Sr. MacDonald identificó áreas más extensas y volúmenes adicionales de contaminación del suelo, piscinas de lodo adicionales y sitios adicionales con contaminación de aguas subterráneas pasibles de remediación, y utilizó costos de remediación locales más elevados que los estimados por el tribunal de Burlington[1081]. Ecuador adujo que, por ende, el Sr. MacDonald no observó el mismo daño que el tribunal de *Burlington* y que Perenco seguía siendo responsable de las áreas de remediación, volúmenes y costos adicionales y/o diferentes[1082].

892. Por lo tanto, Ecuador propuso un marco con base en una comparación sitio por sitio de áreas, profundidad, volúmenes y costos entre aquellos identificados por el Sr. MacDonald y los del tribunal de *Burlington*[1083]. En caso de cualquier duda, Ecuador afirmó que había supuesto que existía una superposición y dio crédito a Perenco. Con arreglo al marco, en el análisis de Ecuador, Perenco era responsable por la suma de USD 130.801.100[1084]:

> (a) **Suelos**: Perenco resultó responsable de los volúmenes y costos adicionales de remediación de lo siguiente: (i) sitios para los que el tribunal de *Burlington* no otorgó costo de remediación alguno; (ii) sitios en los que el Sr. MacDonald delineó áreas diferentes; sitios o áreas en los que las muestras del Sr. MacDonald concluyeron que la contaminación se extendía más allá de las conclusiones del tribunal de *Burlington* o resultaba más profunda; (iii) sitios o áreas en los que las estimaciones de la extensión vertical u horizontal de la contaminación del Sr. MacDonald y del tribunal de *Burlington* eran similares pero respecto de los cuales el Sr. MacDonald estimó costos de remediación más elevados[1085].

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presente Decisión no puede servir y no puede utilizarse para compensar a Ecuador dos veces por el mismo daño".

1080 Escritos Introductorios de Ecuador de fecha 22 de febrero de 2019, párr. 80.

1081 *Id.*, párr. 80.

1082 *Id.*, párr. 80.

1083 *Ibid.*, párr. 81 y Apéndice A.

1084 Apéndice A de los Escritos Introductorios de Ecuador de fecha 22 de febrero de 2019.

1085 Escritos Introductorios de Ecuador de fecha 22 de febrero de 2019, párr. 82.

(b) **Piscinas de lodo**: Perenco resultó responsable de los costos de remediación más elevados de Cóndor Norte y Payamino WTS y también de la totalidad de los costos de remediación estimados para las piscinas de lodo que no cumplían con las normas en 11 sitios, por un total de USD 28.304.000[1086].

(c) **Aguas subterráneas**: Perenco resultó responsable de los nueve sitios adicionales identificados por el Sr. MacDonald que a su juicio demandaban una remediación de las aguas subterráneas y de los mayores costos estimados para la remediación de Coca 2/CPF[1087].

893. Además, Ecuador adujo que tenía derecho a costos de abandono además de los USD 929.722 otorgados por el tribunal de *Burlington* por los siete sitios enumerados en el Plan de Abandono de Sitios de Pozos de Perenco del mes de noviembre de 2008 que nunca se llevó a cabo y cuyos sitios Petroamazonas nunca operó[1088].

894. El argumento de Perenco sobre este tema fue, en esencia, que el pago de *Burlington* con arreglo al Acuerdo de Conciliación "canceló, saldó y cumplió en forma irrevocable, integral y definitiva" [Traducción del Tribunal] todas la obligaciones y pasivos del Consorcio relacionados con las reconvenciones de Ecuador[1089]. Si ese argumento no resultara aceptado, según lo alegado por Perenco, al menos esa suma sufragada deberá deducirse de cualquier costo de remediación que el presente Tribuna pudiere otorgar a Ecuador en el marco del procedimiento que nos ocupa[1090]. Perenco adujo que Ecuador no controvirtió esto[1091]. En aplicación de las correcciones propuestas a las conclusiones del Sr. MacDonald, que redundarían en una indemnización por daños inferior a lo que Ecuador ya había percibido en plena satisfacción de sus reconvenciones, el Tribunal debería dictar un laudo en el que los daños en materia de reconvenciones fueran equivalentes a cero[1092].

1086 *Ibid.*, párr. 83.

1087 *Ibid.*, párr. 84.

1088 *Ibid.*, p 85.

1089 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 74, que hace referencia a CE-CC-431, Anexo 3, pág. 4, párr. 2.

1090 *Ibid.*, párr. 74, que hace referencia a CE-CC-431, Anexo 3, pág. 3, CONSIDERANDO (5).

1091 *Ibid.*, párr. 74.

1092 *Id.*, párr. 74.

895. Naturalmente el Tribunal ha trazado un curso distinto a aquel propuesto por cada una de las Partes. No ha estimado daños en la suma de USD 130.801.100 pagaderos a Ecuador por parte de Perenco, ni ha estado de acuerdo con la afirmación de Perenco de 'daños en materia de reconvenciones equivalentes a cero' [Traducción del Tribunal]

896. Para el momento de la Audiencia Pericial, Ecuador reconocía la existencia de una superposición sustancial en materia de daños ambientales entre los USD 39.199.373 otorgados por el tribunal de *Burlington* y las conclusiones a las que arribara el Sr. MacDonald. (En ocasión de la Audiencia Pericial , Ecuador indicó que el monto máximo sujeto a doble recuperación ascendía a USD 29.078.900)[1093]. Consciente de la afirmación del tribunal de *Burlington* de que "como una cuestión de principio, la presente Decisión no puede servir y no puede utilizarse para compensar a Ecuador dos veces por el mismo daño" [1094], el Tribunal ha discurrido largamente acerca de la protección contra la doble recuperación.

897. Los dos tribunales han abordado las cuestiones de maneras significativamente diferentes, ambos esencialmente, en términos de sus conclusiones en materia de legislación ecuatoriana, y técnicamente, en términos de evaluar la prueba pericial de contaminación en los Bloques. El tribunal de *Burlington* se basó en el muestreo de IEMS y GSI ampliado con la visita al sitio de los Bloques por parte del Tribunal. El presente Tribunal albergaba dudas respecto del trabajo de los peritos de ambas partes y optó por arribar a las conclusiones principales en materia de legislación ecuatoriana que permitirían que las Partes tuvieran la posibilidad de negociar una avenencia, y en el supuesto de que no lograran hacerlo, el Tribunal indicó su intención de nombrar un perito independiente.

898. El presente Tribunal no pretende de ninguna manera faltarles el respeto a los distinguidos miembros del tribunal de *Burlington*, por cada uno de los cuales siente una alta estima, al decidir que el Sr. MacDonald se encontraba mejor posicionado que el tribunal para estimar la magnitud de la contaminación. Es más probable que el trabajo desarrollado por el Sr.

1093 Véase Apéndice A de los Comentarios de Ecuador sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, "Totales".

1094 Decisión sobre Reconvenciones en *Burlington*, párr. 1086.

MacDonald y su equipo de Ramboll haya analizado de manera más integral y precisa el trabajo de IEMS/GSI (tantos sus puntos fuertes como sus puntos débiles) que lo que pudiera haber hecho el tribunal de *Burlington*. El Sr. MacDonald, luego de haber analizado ese trabajo integralmente y de haber diseñado una campaña adicional de muestreo consultando a las Partes, se encontraba, a juicio del presente Tribunal, mejor posicionado para capturar y delinear la magnitud de la contaminación en las áreas de los Bloques que se le permitieron cuantificar. Por lo tanto, el Tribunal ha decidido considerar los USD 39.199.373 otorgados por el tribunal de *Burlington*, y sufragados por Burlington en su avenencia, como pago a cuenta del total de la indemnización por daños que el presente Tribunal ha determinado que Perenco, el verdadero operador del Consorcio, deberá abonar.

899. La suma total después de ajustes de USD 93.638.890 establecida en el párrafo 889 *supra*, se ajusta nuevamente mediante la acreditación a Perenco del pago anterior de USD 39.199.373 para arribar a la cifra de USD 54.439.517**,** misma que Perenco deberá pagar a Ecuador.

6. Instrucción respecto del uso del producido por parte de Ecuador

900. Perenco adujo que cualquier indemnización por daños otorgada a Ecuador no debería utilizarse para compensar los daños adeudados a Perenco. Por el contrario, el Tribunal debería ordenar que Ecuador deposite esa suma en un fondo de remediación que Ecuador deberá utilizar únicamente a los fines de remediación de los Bloques[1095]. Esta, según Perenco, era la única forma de garantizar que realmente se cumpliera el objetivo del Tribunal de proteger el medio ambiente y que Ecuador honrara sus promesas de utilizar los fondos en aras de la remediación, y que el proceso de reconvención completo no fuera socavado para beneficio monetario oportunista de Ecuador[1096]. Perenco observó que Ecuador no objetó esa orden y todo lo que haría un fondo de remediación sería cumplir con su palabra[1097].

1095 Comentarios de Perenco sobre el Informe del Perito Independiente de fecha 22 de febrero de 2019, párr. 75.

1096 *Ibid.*, párr. 75; Tr. (2) (MacDonald) (12 de marzo de 2019) 468.

1097 Tr. (2) (MacDonald) (12 de marzo de 2019) 470.

901. Sobre este punto, el Procurador General de Ecuador confirmó en ocasión de la Audiencia Pericial la afirmación anterior de Ecuador durante la fase de reconvenciones de que "cualquier indemnización por daños que se otorgase a Ecuador por las reconvenciones sería destinada a la restauración de los ecosistemas y Ecuador no tendría inconveniente alguno si el Tribunal considerara necesario el dictado de una resolución al respecto, una resolución que establezca que cualquier indemnización por daños que se le otorgare a Ecuador deberá destinarse a la restauración íntegra de los ecosistemas según lo dispuesto en la Constitución del Ecuador"[1098].

902. El Tribunal ha reflexionado sobre los argumentos de las Partes. En lo que se refiere a la solicitud de Perenco de que se dicten dos laudos separados en materia de daños, uno en favor de cada una de las Partes, y que el pago de la indemnización por daños en el marco de las reconvenciones se realice a un fondo de remediación, el Tribunal observa que el dictado de una resolución que exija el monitoreo continuo de las actividades de remediación de Ecuador no sería consistente con la función del Tribunal en virtud del Convenio del CIADI. Sujeto únicamente a los procedimientos limitados que se contemplan en los Artículos 49-51 del Convenio, una vez que dicta el laudo, el Tribunal deviene *functus officio*.

903. El Tribunal considera además que es en el interés de ambas Partes que se ponga término a este extenso procedimiento y que se permita así que ambas sigan adelante. Por ese motivo, el Tribunal ha decidido dictar un Laudo único en el que se especifiquen los daños y perjuicios que cada una de las Partes se adeuda a la otra, así como los costes asociados a los mismos

904. A su vez, el Tribunal expresa su expectativa firme, con base en declaraciones solemnes realizadas tanto por los abogados de Ecuador como por el propio Procurador General, que el Tribunal ha aceptado, de que el producto del laudo en materia de daños dictado en favor de Ecuador en el contexto de la reconvención ambiental se destinará a la remediación de los Bloques. El Estado ha dejado en claro su interés en remediar la contaminación causada

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[1098] *Ibid.*, 375:2-13. [Traducción del Tribunal]

por las operaciones hidrocarburíferas en la región *Oriente* de Ecuador. Por lo tanto, el Tribunal expresa su clara expectativa de que las sumas pagaderas a Ecuador se destinen a esta importante tarea y no permanezcan en los ingresos generales del Estado.

IV. DAÑOS RECLAMADOS EN RELACIÓN CON LA RECONVENCIÓN DE INFRAESTRUCTURA

905. El Tribunal procede ahora a considerar la reconvención de infraestructura.

Resulta necesario aclarar una serie de cuestiones en lo que respecta a esta reconvención:

(a) Ecuador planteó exactamente la misma reconvención de infraestructura en el marco del arbitraje de *Burlington* que en el presente caso contra Perenco[1099].

(b) Ambas reconvenciones se basan en supuestas violaciones de disposiciones idénticas en los CP para los Bloques 7 y 21[1100], y de la legislación ecuatoriana[1101].

1099 Véase Resp. PHB CC, párrs. 118 y 122: Que declare "que la Demandante es responsable ante Ecuador por los costos necesarios para remediar el mal estado de la infraestructura de los Bloques 7 y 21 dejados por Perenco, dado el incumplimiento por parte de Perenco del [Contrato y de la legislación ecuatoriana]" y que ordene "Que la Demandante pague una indemnización por daños causados al no haber devuelto a Ecuador la infraestructura de los Bloques en buenas condiciones en un monto cuantificado en USD 17.231.458,85" [Traducción del Tribunal]. *Cf.* Decisión sobre Reconvenciones de *Burlington*, párr. 53: Que declare "*(ii)* Que Burlington es responsable ante Ecuador por los costos necesarios para remediar el mal estado de la infraestructura de los Bloques 7 y 21 dejados por Burlington" y que ordene "(iv) Que Burlington pague una indemnización por daños causados al no haber devuelto a Ecuador la infraestructura de los Bloques en buenas condiciones en un monto cuantificado en USD 17.417.765,42 más intereses a una tasa de interés comercial adecuada desde la fecha de su desembolso hasta la fecha del Laudo".

1100 Véanse párrs. 892 y 908 de la Decisión sobre Reconvenciones de *Burlington*, donde tanto Ecuador como Burlington hacen referencia a la Cláusula 5.1.8 del PC del Bloque 7 y a la Cláusula 5.1.7 del PC del Bloque 21.

1101 Véase Resp. PHB CC, párr. 102: "Las operaciones de bajo costo de Perenco incumplieron los Artículos 5.1.7 y 5.1.8 de los [Contratos de Participación] de los Bloques 7 y 21 que exigían la utilización de equipos y tecnología de acuerdo con las mejores normas y prácticas generalmente aceptadas en la industria hidrocarburífera internacional. Independientemente de si la política de no inversión de Perenco resultó violatoria de sus obligaciones contractuales, la Audiencia confirmó que Perenco reintegró la infraestructura de los Bloques a Ecuador en pésimas condiciones que excedían el desgaste normal en incumplimiento de la 'obligation de résultat' en los Artículos 5.1.22 y 18.6 del [Contrato de Participación] del Bloque 7 (Artículos 5.1.21 y 18.6 del [Contrato de Participación] del Bloque 21 y el Artículo 29 de la [Ley de Hidrocarburos del Ecuador No. 2967] …" [Traducción del Tribunal]. Cf. Decisión sobre Reconvenciones de *Burlington*, párrs. 891-892: "Ecuador alega que, tanto en virtud de los PC como de la legislación ecuatoriana, el Consorcio se encontraba doblemente obligado (i) a construir, mantener y reemplazar la infraestructura en los Bloques 7 y 21 de conformidad con los estándares de la industria y (ii) al término del contrato, a entregar al Estado los Bloques en buen estado. Según Ecuador, el Consorcio violó ambas obligaciones, y, en consecuencia, Burlington es responsable de los costos de corrección". Y "Ecuador sostiene que … El Artículo 29 de la Ley

(c) Como puede observarse en el Anexo B de este Laudo, los testigos en lo que respecta a ambas reconvenciones de infraestructura parecen ser prácticamente idénticos.

(d) El tribunal de *Burlington* realizó una visita al sitio que el presente Tribunal no realizó[1102].

(e) La suma reclamada en ambas reconvenciones fue virtualmente idéntica[1103].

(f) Luego de haber visitado las instalaciones y de haber oído a los testigos, el tribunal de *Burlington* otorgó a Ecuador la suma de USD 2.577.119 desglosada de la siguiente manera[1104]:

(i) USD 503.572,76 por los tanques Gacela T-104 y Payamino T-102, así como por reparaciones menores a tuberías;

(ii) USD 1.462.553,43 por reparaciones relacionadas con líneas de flujo y oleoductos; y

(iii) USD 561.900,00 por los motores del Bloque 7; y USD 49.093,58 por nuevos vehículos.

(g) El caso *Burlington* ha finalizado con un Laudo de 7 de febrero de 2017[1105].

(h) Ecuador, aunque inicialmente procuró la anulación de la indemnización por daños otorgada en su contra en favor de Burlington y también de la decisión en el marco de su reconvención ambiental, no pretendió la anulación de la indemnización por daños que se le otorgó en lo que respecta a la reconvención de infraestructura [1106].

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de Hidrocarburos, incorporada por referencia en los PC, dispone asimismo la obligación de entregar la infraestructura al Estado "en buen estado de conservación"".

1102 Véase Decisión sobre Reconvenciones de *Burlington*, párr 18-27.

1103 Véase nota 1100 *supra*.

1104 Véase Decisión sobre Reconvenciones de *Burlington*, párr. 1074.

1105 CA-CC-60.

1106 Solicitud de Anulación de Ecuador de fecha 13 de febrero de 2017,E-426, párr 64, que estableció las causas específicas de la Solicitud de Anulación de Ecuador

> "*… en lo que respecta a las reclamaciones de Ecuador, el Tribunal se extralimitó manifiestamente en sus facultades y no expresó sus motivos cuando resolvió que el régimen de responsabilidad objetiva de la Constitución del año 2008 no tiene efecto retroactivo …, el Tribunal se extralimitó manifiestamente en sus facultades y no expresó sus motivos cuando resolvió que los límites relevantes permisibles no son aquellos aplicables a los ecosistemas sensibles…, el Tribunal no expresó sus motivos para no realizar una delineación vertical…, y el Tribunal se extralimitó manifiestamente en sus facultades y no expresó los motivos en los que basó sus conclusiones cuando resolvió la atribución de responsabilidad entre Burlington y otros*". [Traducción del Tribunal]

(i) Ulteriormente Ecuador y Burlington celebraron un Acuerdo de Conciliación de conformidad con el cual se retiró la solicitud de anulación del Laudo de *Burlington*[1107].

(j) El presente Tribunal ya ha resuelto que no desestimará la reconvención de infraestructura ni la reconvención ambiental fundándose en la causal de cosa juzgada[1108].

906. En consecuencia, el presente Tribunal deberá considerar la reclamación en materia de infraestructura, aunque deberá tener en cuenta que otro tribunal ya se ha pronunciado al respecto y ha otorgado una indemnización por daños en ese sentido. Ese tribunal no solo oyó virtualmente las mismas pruebas acerca de los mismos incumplimientos y consideró las mismas alegaciones en cuanto a los daños, sino que observó personalmente las condiciones climáticas y de otra índole cuando realizó su visita de campo[1109].

907. Es más, como se señaló *supra*, Ecuador no pretendió la anulación de la parte del laudo de *Burlington* relacionada con la infraestructura[1110], por lo tanto, debe suponerse a los fines presentes que estaba satisfecha con dicho laudo. Ecuador ha señalado con razón que no puede beneficiarse de la doble recuperación, por lo tanto, en muchos aspectos, la tarea del presente Tribunal es mayormente redundante[1111].

1107 *Burlington*, Resolución de la Secretaria General que Toma Nota de la Terminación del Procedimiento, CA-CC-121.

1108 Decisión sobre la Solicitud de Perenco para que se Desestimen las Reconvenciones de Ecuador de fecha 18 de agosto de 2017, párrs. 47-51.

1109 Véanse párrs. 9041(b), 9041(c) y 9041(d) *supra*.

1110 Véase párr. 9041(h) *supra*.

1111 Véase Respuesta, párr. 110: "Ecuador siempre ha estado de acuerdo con evitar la doble recuperación en relación con sus reconvenciones, tal como se ha indicado en numerosas ocasiones durante ambos, el presente procedimiento de arbitraje y el de Burlington. El último compromiso de Ecuador se asumió en el contexto de la Avenencia de Burlington, en la cual aceptó que '*Ecuador no tiene derecho a recibir y no procurará una doble compensación en relación con los mismos montos y daños ambientales y de infraestructura, constantes en la Decisión sobre las Reconvenciones en contra de Burlington*'" [Traducción del Tribunal]. Véase también nota al pie 158: "Audiencia sobre Contrademandas, Transcripción (ESP), D8:P2391:L17-P2392:L1 (Árbitro Kaplan, Silva Romero) ("ÁRBITRO KAPLAN: Así que si ustedes recuperan algo aquí, menos de la reclamación que ustedes han planteado, están buscando el resto en la otra. SR. SILVA ROMERO: Sí, creo que tendríamos que informarle esto al Tribunal de Burlington. Burlington, Audiencia sobre Contrademandas

908. En un comienzo es necesario prestar cuidadosa atención a lo que ha establecido el tribunal de *Burlington* en los párrafos 1080 a 1086 de su Decisión sobre las Reconvenciones que se exponen *infra*[1112]:

> "1080. Como cuestión final, el Tribunal debe abordar el tema de la doble recuperación. Como se menciona en el párrafo 70 supra, Burlington ha llamado la atención del Tribunal respecto del potencial riesgo de doble recuperación en relación con las reconvenciones de la Demandada, ya que Ecuador "realizó una reclamación integral por el presunto daño ambiental en cada uno de los casos Burlington y Perenco". Burlington solicita que el Tribunal analice las "consecuencias potencialmente perniciosas" derivadas de ese riesgo de modo que "si la parte dispositiva de cualquiera de los laudos sobre reconvenciones dispusiera cualquier compensación, se impidiera que Ecuador ejecute el segundo laudo en la medida en que ya haya sido compensado por el primero".
>
> 1081. El Tribunal observa que no existe controversia alguna entre las Partes en lo que se refiere al tema de la doble recuperación. Más específicamente, primero, no hay ninguna duda que Ecuador reclama compensación por los mismos daños en el presente procedimiento y en el procedimiento paralelo en Perenco. Para Burlington, Ecuador "procura obtener dos veces un 100% de recupero de precisamente los mismos presuntos daños, por precisamente el mismo presunto perjuicio, sobre precisamente los mismos fundamentos de derecho y de hecho". Ecuador, por su parte, no niega que procure obtener compensación por el mismo perjuicio en ambos casos, aunque distingue entre los dos arbitrajes de diversas maneras, afirmando por ejemplo que los argumentos o las pruebas en ambos casos no "son exactamente iguales". De hecho, Ecuador invoca la responsabilidad solidaria de los socios del Consorcio para justificar su reclamación contra Burlington, aunque sólo Perenco operaba los Bloques.
>
> 1082. Segundo, no se controvierte asimismo en que reclamar compensación por el mismo daño en el marco de procedimientos paralelos genera un riesgo de doble recuperación. En este contexto, Ecuador afirma que cualquier tribunal que dicte el último laudo sobre las reconvenciones de Ecuador puede tratar fácilmente este riesgo y, por lo tanto, el temor de "consecuencias perniciosas" de Burlington está fuera de contexto:
>
> "Ecuador […] agrega que sus reconvenciones no redundarán en 'consecuencias perniciosas'. Si la Demandante alude a la cuestión de la doble recuperación, su prohibición se aplica exclusivamente cuando una

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de 2014, Transcripción (ESP), D7:P2444:L1-7 (Apertura, Silva Romero) "El segundo comentario que tengo es que se me ha pedido que realice el siguiente comentario. No queremos que el Tribunal de Burlington tenga preocupación alguno [sic] en lo que hace a la recuperación doble. Esto no es lo que está buscando Ecuador. Ecuador simplemente está tratando de restaurar, restablecer los ecosistemas en los bloques 7 y 21", E-440. Véase también, Decisión sobre Reconvenciones de Burlington, ¶ 70, CA-CC-59".

[1112] Decisión sobre Reconvenciones en *Burlington* [Notas al pie omitidas].

> parte ya ha sido indemnizada por un tercero. Además, la Demandante no puede simular ignorar que cualquier segundo laudo en el marco de los presentes casos contra los miembros del Consorcio 'podría elaborarse de manera tal de evitar la doble recuperación. El derecho internacional, la legislación ecuatoriana y las decisiones internacionales ofrecen numerosos mecanismos para evitar la doble recuperación, incluyendo el tener en cuenta la reparación monetaria otorgada por cualquier laudo anterior".
>
> 1083. Tercero, las Partes coinciden en que un acreedor sólo puede ser compensado una única vez por un daño dado, y con razón, ya que una serie de tribunales de arbitraje han reconocido que la "la prohibición de doble compensación por la misma pérdida es un principio bien establecido".
>
> 1084. Cuarto, el Tribunal toma nota de que, con anterioridad al término de la Audiencia sobre Reconvenciones, los abogados en representación de Ecuador afirmaron claramente que Ecuador no procura obtener doble recuperación en sus reclamaciones en contra de los miembros del Consorcio:
>
> "El segundo comentario que tengo es que se me ha pedido que realice el siguiente comentario. No queremos que el Tribunal de Burlington tenga preocupación alguna en lo que hace a la recuperación doble. Esto no es lo que está buscando Ecuador".
>
> 1085. El Tribunal toma debida nota de las declaraciones de Ecuador, que están en consonancia con el principio general que prohíbe la doble recuperación.
>
> 1086. A la fecha de la presente Decisión, el Tribunal de Perenco no ha emitido aun decisión alguna sobre las reconvenciones ante sí. Por lo tanto, el presente Tribunal carece de la información o del fundamento necesarios para adoptar medidas específicas – para dar forma a su decisión, tomando prestada la frase de Ecuador – a fin de evitar la doble recuperación, una tarea que deberá delegar en el tribunal de Perenco en tanto es quien está decidiendo en segundo lugar. Dicho esto, este Tribunal afirma sin embargo que, como una cuestión de principio, la presente Decisión no puede servir y no puede utilizarse para compensar a Ecuador dos veces por el mismo daño".

909. Sin embargo, consistente con el deber de independencia del Tribunal de considerar el caso presentado ante sí, el Tribunal explicará brevemente su opinión.

910. El Tribunal funda su determinación de la reconvención en dos consideraciones principales.

911. La primera es que está convencido de que en los años de deterioro de los Bloques, habida cuenta de las distintas probabilidades, Perenco habría estado menos preocupada por el

mantenimiento de las instalaciones que hasta entonces[1113]. En consecuencia, no resultaría sorprendente para el Tribunal que, de hecho, hubiese algunos incumplimientos de las obligaciones de los CP que se expondrán *infra*.

912. Por otra parte, el Tribunal es consciente de las condiciones desafiantes de operar en el bosque tropical amazónico y la predisposición a la oxidación y corrosión en dicho clima[1114]. El Tribunal es también consciente de que se habían operado los Bloques tanto antes como después de la gestión de los Bloques por parte de Perenco[1115].

A. Posición Jurídica

913. No se cuestiona que ciertas cláusulas de los CP cubren las obligaciones del Consorcio respecto de la infraestructura de los Bloques no solamente durante las operaciones del Bloque 7, sino también una vez concluidos los CP[1116].

914. La Cláusula 5.1.8 del CP del Bloque 7 y las cláusulas 5.1.7 del CP del Bloque 21 exigían que el Consorcio empleara personal calificado, equipos y tecnología adecuados durante la operación de los bloques.

1113 Véase también, párr. [252] *supra*: "*En opinión del Tribunal, es un hecho que la manera de pensar del Consorcio habría estado dominada por el inminente vencimiento del contrato. El Tribunal considera que el pronunciado incremento en el precio del petróleo hasta octubre de 2007 habría inducido a Perenco a procurar perforar tantos pozos como fuera económicamente posible en el yacimiento Oso durante el plazo restante del Contrato. Según el Sr. Crick, a falta de prórroga contractual, Perenco habría dejado de perforar en el Bloque 7 en agosto de 2009, a fin de asegurar un reintegro suficiente respecto de los pozos nuevos. El Sr. Crick estima que Perenco pudo haber perforado 24 pozos por año en el Bloque 7. El Tribunal acuerda y acepta los perfiles de producción del Sr. Crick*".

1114 Decisión Provisional sobre la Reconvención Ambiental, párr. 408.

1115 Los comentarios realizados con respecto a la reclamación de Ecuador por daños ambientales resultan asimismo aplicables a la reclamación de infraestructura. Véase Decisión Provisional sobre la Reconvención Ambiental, párrs. 490, 589, 591, 597 y 598.

1116 Véase Memorial de Contestación sobre Responsabilidad y Reconvenciones de Ecuador, párrs. 916, 918-919, que hacen referencia a las Cláusulas 5.1.7 y 5.1.21 del Contrato de Participación del Bloque 21 y Cláusulas 5.1.8 y 5.1.22 Contrato de Participación del Bloque 7, así como también a las Cláusulas 18.6 de ambos Contratos de Participación y al Artículo 29 de la Ley de Hidrocarburos, que se incorpora a modo de referencia en los Contratos de Participación. *C.f.* Memorial de Contestación sobre las Reconvenciones de Perenco, párrs. 516 y 524-525, que hace referencia a las mismas cláusulas y a la misma disposición.

915. La Cláusula 5.1.8 reza lo siguiente[1117]:

> "5.1 Obligaciones de la Contratista: …
>
> …
>
> 5.1.8 Emplear personal calificado, así como también equipos, maquinarias, materiales y tecnología de conformidad con las normas y prácticas aceptadas generalmente en la industria petrolera internacional".

916. La Cláusula 5.1.7 asimismo establece[1118]:

> "5.1 Obligaciones de la Contratista: …
>
> …
>
> 5.1.7 Utilizar personal, equipos, maquinarias, materiales y tecnología de conformidad con los más altos estándares y prácticas generalmente utilizadas en la industria hidrocarburífera internacional".

917. Al término de los CP, las cláusulas 5.1.22 y 18.6 del CP del Bloque 7 y las cláusulas 5.1.21 y 18.6 del CP del Bloque 21, disponen que el Consorcio deberá restituir los pozos junto con todos los equipos, herramientas, máquinas, instalaciones (adquiridas para los CP y durante su plazo) a Petroecuador en buenas condiciones, a excepción del desgaste por uso normal, y sin costo alguno. Estas disposiciones establecen precisamente lo siguiente:

> CP del Bloque 7[1119]
>
> "5.1.22Al término de este Contrato, los pozos, bienes, instalaciones, equipos e infraestructura relacionados al presente Contrato, se restituirán a PETROECUADOR sin costo alguno y en buen estado de conservación, según las disposiciones del Artículo veintinueve (29) de la Ley de Hidrocarburos".
>
> "18.6 Al término del presente Contrato, ya sea por vencimiento del Período de Producción o por cualquier otra causal durante el mismo Período, la Contratista entregará a PETROECUADOR, sin costo y en buen

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1117 CE-CC-028.

1118 CE-CC-013.

1119 CE-CC-028.

> estado de conservación, los pozos en producción, y, en buena condición, los equipos, herramientas, maquinaria, instalaciones y demás bienes del presente Contrato."
>
> CP del Bloque 21[1120].
>
> "5.1.21 Al término del presente Contrato, la Contratista entregará a PETROECUADOR, sin costo y en buen estado de conservación, los pozos, bienes, instalaciones y equipos que haya adquirido a los fines del Contrato de conformidad con el artículo 29 de la Ley de Hidrocarburos."
>
> "18.6 Al término de este Contrato y al final del Período de Producción o por cualquier otra causal que ocurra durante el mismo período, la Contratista entregará a PETROECUADOR, sin costo y en buen estado de producción, los pozos que en tal momento estuvieren en actividad, y en buenas condiciones, salvo por el desgaste normal, todos los demás equipos, herramientas, maquinarias, instalaciones y demás muebles e inmuebles adquiridos para los fines del presente Contrato".

918. Asimismo, es preciso invocar el Artículo 29 de la Ley de Hidrocarburos que se menciona *supra*, el cual establece lo siguiente:

> "[A]l término de un contrato de exploración y explotación, por vencimiento del plazo o por cualquier otra causa ocurrida durante el período de explotación, el contratista o asociado deberá entregar a PETROECUADOR, sin costo y en un buen estado de producción, los pozos que en tal momento estuvieren en actividad; y, en buenas condiciones, todos los equipos, herramientas, maquinarias, instalaciones y demás muebles e inmuebles que hubieren sido adquiridos para los fines del [C]ontrato". [1121]

919. Con respecto a la obligación de cumplir con las prácticas generalmente aceptadas en la industria petrolera internacional, cabe señalar que el Artículo 10 del RAHOE dispone que la contratista *"deberá aplicar, al menos"* el estándar de la API *"y cualquier otra norma o estándar de la industria petrolera"*[1122].

1120 CE-CC-013.

1121 EL-90

1122 EL-148.

> "Normas y Estándares:
>
> En operaciones relativas a hidrocarburos, PETROECUADOR y la contratista deberán aplicar, como mínimo, las prácticas recomendadas por el Instituto Americano del Petróleo (API, por sus siglas en inglés)" en especial las siguientes: "Exploration and Production standards" y "Manual of Petroleum Measurement standards" y cualquier otra norma de la industria petrolera".

920. Además, el RAOHE establece estándares específicos relacionados con la infraestructura y contiene varias referencias a los estándares API. No existe controversia entre las Partes respecto de que los estándares del API combinan técnicas de mantenimiento preventivo y predictivo[1123].

921. Como señaló el tribunal de *Burlington*, y como ha sucedido en el presente caso, ambas Partes impugnan la credibilidad o relevancia de los testigos y peritos de la otra Parte., el Tribunal tiene presente que los testigos proporcionaron pruebas en relación con cuestiones ocurridas algunos años antes y en estas circunstancias, de la misma manera que el tribunal de *Burlington*[1124]. El Tribunal recurre más a documentos contemporáneos que es posible que contribuyan a determinar el estado de la infraestructura a partir de la fecha de adquisición de las operaciones.

922. Una parte importante de la defensa respecto de la reconvención sobre infraestructura de Perenco se fundaba en dos informes contemporáneos confeccionados por SGS ("**Informes SGS**") en los años 2009 y 2010[1125]. Ambos informes evalúan el estado de la infraestructura, la cual incluía las instalaciones, equipos y otros bienes de los Bloques 7 y 21, de acuerdo con cinco categorías que varían desde muy bueno a deficiente. Según dichos informes, se consideró que una mayoría significativa de la infraestructura se encontraba en buen estado o en muy buen estado. Este informe parece estar relacionado con la reclamación sobre

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1123 Memorial de Contestación sobre las Reconvenciones de Perenco, párrs. 519-521 *c.f.* Réplica de Ecuador sobre las Reconvenciones, párr. 456.

1124 Véase, por ejemplo, Decisión sobre Reconvenciones de *Burlington*, párrs. 933-936.

1125 CE-CC-217; CE-CC-240.

compensación de Ecuador en *Burlington* respecto de solo 3 tanques (de los 89) y 3 bombas (de las 16)[1126].

923. Es cierto que Ecuador invita al Tribunal a desestimar los Informes SGS bajo el argumento de que se tratan de simples inventarios de activos[1127]. El Tribunal disiente, ya que invoca en gran medida los Informes SGS, en especial ante la ausencia de otras pruebas.

924. Otro punto importante a tener en cuenta, como se mencionó precedentemente, es que Petroamazonas expandió las operaciones e incrementó la perforación y producción en ambos Bloques, al menos, desde enero de 2010 en adelante[1128]. Como señaló el Tribunal de *Burlington*, con lo cual el presente Tribunal concuerda, *"esta expansión y aumento en la producción implicaría una necesidad de mejorar la infraestructura existente*[1129]*"*. Ecuador ha argumentado ante ambos tribunales que ninguno de los montos reclamados se asocia con la expansión de la producción en los Bloques. Sin embargo, si algo queda claro es que las pruebas de las actividades de expansión de Petroamazonas hacen que sea difícil

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1126 Ecuador renunció a su pretensión sobre la compra de 5 bombas Power oil, ya que todavía no se habían adquirido, véase Réplica sobre Reconvenciones de Ecuador, párr. 519

Véase CE-CC-348 (número total de tanques). En relación con la reclamación de Ecuador respecto de los tanques en el presente caso, véase Montenegro WSI, párr. 23, apartado 6: el único tanque reparado fue el tanque Payamino T-102, Réplica sobre Reconvenciones de Ecuador, párrs. 521, 529: el tanque T-104 de Gacela CPF se ha reparado y se realizaron reparaciones de emergencia en el tanque Payamino T-102 y en el tanque Yuralpa T-400.

El Tribunal señala que Ecuador, en su Resp. PHB CC, párr. 112, intenta explicar que lo que está reclamando es que *"al menos 12 tanques fueron devueltos en malas condiciones... no 3, como alega erróneamente Perenco"*. [Traducción del Tribunal]

En relación con la reclamación respecto de las bombas, véase CE-CC-217, B7 Amortizables y B21 Amortizables (número total de bombas). La reclamación de Ecuador es respecto de (i) bombas de transferencia y multietapa horizontal nuevas en los campos de Oso y Gacela (Montenegro WSII, Anexo 3, pág. 4); (ii) reparaciones a dos bombas Power Oil en el campo Coca (Luna WSIII, párr. 153; Luna WSIII, Anexos 77-78; Réplica sobre Reconvenciones de Ecuador, párr. 519).

1127 Véase Réplica sobre Reconvenciones de Ecuador, párrs. 489, 491, 496. Véase también Luna WSIII, párr.69.

1128 Véase Memorial de Contestación sobre Reconvenciones de Perenco, por ejemplo, párrs. 31, 376 y 512 que describen los costos que se reclaman presuntamente asociados con la expansión por parte de Ecuador/Petroamazonas de los Bloques *c.f.* Réplica sobre Reconvenciones de Ecuador, Sección 4.4.3, en la que niega haber incluido los costos asociados con la expansión del Bloque 7 por parte de Petroamazonas pero no niega que existan planes actuales para la expansión del Bloque 7.

1129 Decisión sobre Reconvenciones de *Burlington*, párr. 937.

establecer los hechos tal y como se presentaban en el momento en que el Consorcio abandonó los Bloques. El Tribunal deberá tenerlo en cuenta en todo momento.

925. Al final de la audiencia sobre las reconvenciones y luego de los escritos de cierre, el Tribunal, luego de una cuidadosa deliberación, llegó a la conclusión que el valor de las reclamaciones de Ecuador respecto de la Reconvención sobre Infraestructura era excesivo. El Tribunal llegó a la conclusión de que había algunos incumplimientos de obligaciones, que resultaban en una indemnización por daños y perjuicios, pero a la luz de todas las pruebas presentadas, a juicio del Tribunal, dicha indemnización rondaba los USD 2 millones, aproximadamente.

926. El Tribunal ha leído el Laudo de *Burlington* y concuerda en términos generales con los ítems de incumplimiento hallados por dicho tribunal con respecto a la reconvención sobre infraestructura. El tribunal de *Burlington* consideró los ítems de dicha reconvención detalladamente y, dado que sus conclusiones, en gran medida, coinciden con la opinión del presente Tribunal al respecto, no tendría sentido realizar una recitación detallada de las pruebas (virtualmente idénticas en ambos casos) y de los argumentos respecto de cada pretensión. No obstante, el Tribunal expondrá brevemente su razonamiento y conclusiones sobre los puntos controvertidos.

B. Tanques

927. Ecuador expone las prácticas del Consorcio respecto de la compra de tanques de almacenamiento subestándar y de partes recicladas de tanques antiguos de distintos campos para construir tanques "*nuevos,*" de una manera que no cumplía con los estándares y exigencias internacionales[1130]. Al igual que el tribunal de *Burlington*, este Tribunal no está convencido de que Ecuador haya sustanciado su afirmación de que el Consorcio no construyó ni mantuvo los tanques de conformidad con los estándares y prácticas de la industria.

[1130] Réplica sobre Reconvenciones de Ecuador, párrs. 500 y 501.

928. El presente Tribunal también invoca las pruebas del Dr. Egan acerca de que todos los tanques fueron construidos de conformidad con la norma API 650[1131]. Existen pruebas de que los tanques se inspeccionaban regularmente y se llevaban registros[1132], de que se monitoreaba la corrosión de los tanques según la norma API 653, de que se implementó un programa efectivo de protección catódica[1133], de que se diseñaron planes para reparar los tanques de mayor tamaño en los bloques y de que el Consorcio mantuvo informado a Ecuador de las reparaciones de los tanques[1134]. El presente tribunal también concuerda con el hecho de que Ecuador limita sus comentarios a un porcentaje reducido de los tanques y reclama una indemnización por daños y perjuicios para solo 12 de ellos, lo cual es indicativo de que el plan de mantenimiento del Consorcio era, en términos generales, adecuado.

929. El Tribunal, además, señala el punto del Dr. Egan respecto de que Petroamazonas realizó las inspecciones entre uno y tres años después de la toma de posesión de los Bloques y sobre que el tipo de corrosión identificada por Petroamazonas es uno que ocurre rápidamente[1135]. Esta conclusión genera ciertas dudas acerca de si la corrosión hallada se debía, efectivamente, al mantenimiento insuficiente por parte del Consorcio, y el Tribunal tiene presente que la carga probatoria recae sobre Ecuador. El Tribunal no está convencido de que el daño a los tanques, objeto de reclamación, haya sido provocado por las operaciones del Consorcio. A juicio del Tribunal, lo más probable es que el estado de los tanques se haya deteriorado desde que Petroamazonas tomó posesión de los Bloques y esto niega cualquier responsabilidad por parte del Consorcio. Por consiguiente, el Tribunal también está convencido de que Ecuador no ha establecido que el Consorcio violara su obligación de construir y mantener los tanques de conformidad con los estándares de la industria.

1131 Intertek ER I, párr.107.

1132 *Ibid.*, párr. 117.

1133 *Ibid.*, párr. 116.

1134 *Ibid.*, párr. 119, que hace referencia a CE-CC-087, págs. 3-5.

1135 Intertek ER II, párrs. 79-81, que hacen referencia a Luna WS III, párr. 65, que analiza tipos de corrosión "*homogénea*" y "*localizada*".

930. Asimismo, además de construir y mantener los tanques, Ecuador aduce que el Consorcio entregó ciertos tanques que muestran un deterioro más allá del desgaste normal[1136]. En su Escrito Posterior a la Audiencia, Ecuador afirma que pretende una indemnización por daños y perjuicios en relación con "al menos 12 tanques que fueron entregados en malas condiciones..., no 3, como alega equivocadamente Perenco[1137]". El Tribunal ha revisado el expediente y, si bien, como se señaló precedentemente, Ecuador efectivamente realizó comentarios sobre la presuntas malas condiciones de 12 tanques, solamente ha proporcionado detalles sobre los trabajos de reparación y costos de tres tanques específicos, por ende, el Tribunal analizará brevemente esos tres tanques.

1. Tanque Gacela T-104

931. Los documentos proporcionados muestran que este tanque fue inspeccionado en los años 2010, 2011 y 2012[1138]. En una inspección del mes de diciembre de 2010, se detectaron problemas con el techo del tanque que presentaba un alto nivel de oxidación[1139]. La inspección del año 2011 mostró que los procesos corrosivos habían aumentado y se determinó que se "*requería*" un "*cambio completo del techo*"[1140].

932. Cuando se lo inspeccionó en diciembre del año 2008 y, nuevamente, en abril de 2009, apenas meses antes de que el Consorcio suspendiera las operaciones, el techo aun se encontraba en condiciones suficientemente buenas[1141]. El Dr. Egan afirma que Ecuador no explicó de qué manera eran atribuibles al Consorcio las cuestiones encontradas al momento de las inspecciones realizadas entre diciembre de 2010 y febrero de 2012. Las cuestiones de la reclamación solamente se documentaron como "*situaciones nuevas*" un año y medio después, en diciembre del año 2010[1142]. El Dr. Egan además argumentó que era

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1136 Véase generalmente Réplica sobre Reconvenciones de Ecuador, Sección 4.3.2.1.

1137 Resp. PHB CC, párr. 112. [Traducción del Tribunal]

1138 Luna WS III, Anexos 55 a 57.

1139 *Ibid.*, Anexo 55.

1140 *Ibid.*, Anexo 56, págs. 6 y 7 (de la traducción al inglés).

1141 CE-CC-164; CE-CC-341.

1142 Intertek ER II, párr. 88, que hace referencia a Luna WS III, Anexo 55.

completamente posible que la pequeña corrosión identificada en el mes de abril de 2009 avanzara rápidamente y se hiciera visible en diciembre de 2010, de hecho, la inspección de 2010 indicó que la perforación en el techo era "*nueva*"[1143].

933. El Dr. Egan en función de esto, extrapoló que también se encontraba en buenas condiciones en el mes de julio de 2009[1144].

934. En contraposición a las conclusiones del tribunal de *Burlington*, el presente Tribunal coincide con el análisis del Dr. Egan dado el poco tiempo transcurrido al momento de la inspección de abril de 2009. Si bien podría haberse producido corrosión incipientemente, la mayor parte de ella parece haberse producido luego de que el Consorcio abandonara el Bloque. El Tribunal considera que lo más probable es que la causa de la corrosión identificada no pueda atribuirse a las operaciones del Consorcio.

935. El Tribunal considera que no existen motivos por los cuales reembolsar a Ecuador los costos reclamados.

2. Tanque Payamino T-102

936. Ecuador aduce que las inspecciones de este tanque se realizaron entre los años 2010 y 2011; y, como soporte, proporciona el contrato firmado entre Petroamazonas y Conduto para efectuar las reparaciones del tanque T-102, las cuales se centraron principalmente en la limpieza y pintura del tanque tanto en su interior como exterior[1145]. Resulta significativo que dicho documento no contenga ninguna descripción del estado del tanque en ese entonces.

937. Existe, por el contrario, prueba documental previa a julio de 2009 en un documento preparado por el Consorcio en abril de 2008 en el que se establecen las bases del proceso de licitación para reparar los tanques Coca y Payamino[1146]. Dicho documento revela que

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1143 *Ibid.*, párr. 89, que hace referencia a Luna WS III, Anexo 55. [Traducción del Tribunal]

1144 *Ibid.*, párr. 88.

1145 Montenegro WS 3, Anexo 5.

1146 Solís WS2, Anexo 34.

en el mes de marzo de 2008 este tanque requería tareas adicionales de inspección y reparación, pero no se encontraba en estado crítico en ese entonces. El documento afirma que el tanque debía limpiarse y pintarse[1147]. El Consorcio desarrolló un plan de proyecto con una fecha de inicio propuesta para el mes de octubre de 2009 y una duración de aproximadamente dos meses para realizar las reparaciones necesarias"; sin embargo, para ese entonces el Consorcio ya no operaba en los Bloques[1148]".

938. No obstante, el punto sigue siendo que, si el Consorcio hubiera continuado operando en los Bloques, habría incurrido en el gasto que había planeado y, en ese contexto, el Tribunal considera que no existen motivos por los que Perenco no debería asumir el costo de estas reparaciones que debería haber asumido de haber ocurrido de otra manera los acontecimientos.

939. Ecuador ha reclamado USD 322.960,42, sobre lo cual aclara que corresponde a las reparaciones de emergencia realizadas en varias líneas de flujo y oleoductos, en el tanque Payamino T-102, en el tanque Yuralpa T-400, en los campos Jaguar y Yuralpa, *etc*[1149]. El Tribunal concuerda con el tribunal de *Burlington* respecto de que Ecuador no ha justificado totalmente los reclamos en materia de otras reparaciones y mejoras que se exponen en el Anexo 3 de la Segunda Declaración Testimonial del Sr. Montenegro. El Tribunal además concuerda con el tribunal de *Burlington* respecto de que el monto recuperable en virtud de esta pretensión debería reducirse a USD 210.130,76, que es la suma correspondiente a las reparaciones realizadas en este tanque y oleoductos[1150].

1147 *Ibid.*, Anexo 34, págs. 15-17 de la versión en inglés. [Este Anexo no está disponible en Box…se habla del tema en las págs. 17-18 de Solís WS2]

1148 Intertek ER II, párr. 93, que hace referencia a CE-CC-343.

1149 Réplica sobre Reconvenciones de Ecuador, párr. 529.

1150 El Tribunal señala que el tribunal de *Burlington* restó todos los ítems que no se relacionan de forma evidente con las reparaciones realizadas al Tanque Payamino T-102 u oleoductos, tales como, entre otras, mejoras realizadas en la cocina y el comedor del campo Jaguar o reemplazo de los pisos en las oficinas de Yuralpa. (Véase nota al pie 1982 de la Decisión sobre Reconvenciones). El Tribunal concuerda con este enfoque.

3. Tanque Yuralpa T-400

940. En el mes de julio de 2009, el Informe de SGS describió que el tanque se encontraba en "buen" o "muy buen" estado[1151].

941. Con respecto a este tanque, se realizaron dos inspecciones en el mes de marzo de 2011. Durante la primera inspección, se recomendó una reparación completa del interior del tanque, y se identificaron algunas cuestiones que no ponían en riesgo inmediato la integridad mecánica y estructural del tanque[1152]. El segundo informe determinó que no se evidenciaban problemas que pudieran poner en riesgo inmediato la integridad mecánica y estructural[1153]. Es justo señalar que todas las referencias a este tanque en los Informes de SGS indican que los tanques se encontraban en "buen" o "muy buen" estado[1154].

942. Sin embargo, el mayor problema consiste en que la primera inspección en la que se identificó el estado defectuoso de este tanque data del mes de marzo de 2011, es decir dos años después de que el Consorcio finalizara las operaciones. Tomando en consideración que el Informe SGS de junio de 2009 describe el estado de los componentes de este tanque en términos favorables, el Tribunal considera que Ecuador no logró demostrar que los daños del equipo, y los costos relacionados con el estado de este equipo, fueron causados por el Consorcio. Por ende, se desestima esta reclamación.

C. Reclamaciones relacionadas con líneas de flujo y oleoductos

943. El tribunal de *Burlington* abordó este asunto con un alto grado de detalle entre los párrafos 965 y 1006 de su Decisión sobre Reconvenciones. El presente Tribunal ha considerado cuidadosamente dichos párrafos y todos los documentos a los que allí se hace referencia, mismos que también fueron presentados en el presente procedimiento. El Tribunal

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1151 CE-CC-217.

1152 Luna WS III, Anexo 52.

1153 *Ibid.*, 53.

1154 CE-CC-217, inventarios de los Bloques 7 y 21 de SGS, julio de 2009.

concuerda con el análisis realizado por el tribunal de *Burlington* y no considera que tenga sentido establecer nuevamente este asunto técnico.

944. La reclamación respecto de esta pretensión es de USD 1.667.655,83. Esto se funda en las pruebas del Sr. Luna, pero el Tribunal señala, tal como hiciera el tribunal de *Burlington*, que en su última declaración testimonial calculó esta reclamación en USD 1.462.553,43 desglosados en cinco componentes que se exponen en el párrafo 1005 de la Decisión de *Burlington sobre las Reconvenciones*[1155]. Teniendo en cuenta que Ecuador no pretende el reemplazo del sistema de oleoductos, pero ha limitado sus reclamaciones al costo de dos inspecciones y reparaciones tanto urgentes como necesarias, tal como se expone en el párrafo recientemente mencionado *supr*a, el presente Tribunal concuerda en que Ecuador debería recibir una suma de compensación de USD 1.462.553,43.

D. Reclamaciones relacionadas con motores generadores

945. Esta reclamación se relaciona con varios motores generadores eléctricos en los Bloques 7 y 21, los cuales, presuntamente, se encontraban en pésimo estado cuando el Consorcio abandonó los Bloques. La reclamación de Ecuador se centra en los motores Wärtsilä 2, 3 y 4 en el Bloque 21, y en los 27 motores Caterpillar en el Bloque 7. La alegación de Ecuador consiste en que el Consorcio no reacondicionó adecuadamente estas máquinas y en que, además, utilizó una mezcla perjudicial de crudo y diésel en los motores del Bloque 7, lo cual les causó daños. Esta reclamación se funda en los costos de los reacondicionamientos, la reducción de la vida útil de los motores y la compra de un nuevo alternador para el motor Wärtsilä 4. El total de los costos de las reclamaciones es de USD 6.540.010,57; de los cuales USD 4.744.733,75 se relacionan con el Bloque 21 y USD 1.795.276,18 se relacionan con el Bloque 7.

946. Con respecto a la reclamación en relación con los reacondicionamientos, no existe controversia acerca de que los motores necesitan mantenimiento preventivo, el cual incluye monitoreo, prueba y reacondicionamientos. Sin embargo, habiendo considerado las pruebas y puntualmente las declaraciones testimoniales del Sr. Luna y el informe pericial

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[1155] Véase Luna WS III, párrs. 163-169.

del Dr. Egan, así como también los registros de mantenimiento del Consorcio, el presente Tribunal concuerda con el razonamiento del Tribunal de *Burlington* −establecido entre los párrafos 1021 y 1026 de la Decisión de Burlington sobre las Reconvenciones− en que Ecuador no proporcionó pruebas suficientes sobre cualquier presunción acerca de que no se realizaron los reacondicionamientos oportunos a los motores generadores o sobre que esto haya incrementado los costos de mantenimiento o reducido la vida útil de los motores. Por consiguiente, se deniega esta reclamación.

947. Ecuador además sostiene que el daño fue provocado por la utilización de una mezcla de crudo y diésel. Aparentemente, esta mezcla de diésel y crudo era más barata y Ecuador aduce que el efecto de esta mezcla sobre los motores fue catastrófico. No existe controversia sobre que el Consorcio efectivamente utilizó una mezcla de crudo y diésel en el Bloque 7, pero Perenco sostiene que era una elección razonable y que contaba con la aprobación del Gobierno, y que, además, no tenía un impacto perdurable sobre los motores[1156].

948. No se cuestiona que el Consorcio decidió dejar de utilizar esta mezcla luego de, aproximadamente, siete meses. El Sr. d'Argentré argumentó que esto se debía a cuestiones de costos, pero el Tribunal no está convencido de que el costo fuera la única razón y tiene derecho a inferir que esto se debía, al menos en parte, a que la mezcla no funcionaba correctamente.

949. Es cierto que el Ministerio de Minas y Petróleo tenía conocimiento de la práctica de utilizar esta mezcla y que no se oponía a ella[1157]. No obstante, el Tribunal considera que la responsabilidad por el buen estado de los equipos aun recae sobre el Consorcio. Los documentos proporcionados al Tribunal muestran que la utilización de la mezcla podía conllevar a mayores costos de mantenimiento y repercutir en la vida útil de los motores. Asimismo, como se ha mencionado, el propio Consorcio discontinuó la utilización de esta mezcla.

1156 Memorial de Contestación sobre Reconvenciones de Perenco, párrs. 567 – 572.

1157 d'Argentré WS III, párr. 59, que hace referencia a CE-CC-146.

950. Por las razones mencionadas *supra* y por aquellas mencionadas en el Laudo de *Burlington* al respecto, el Tribunal está convencido de que la utilización de la mezcla efectivamente repercutió en el estado de los motores.

951. Ecuador reclama una suma total de USD 1.795.276,80 en relación con los motores en el Bloque 7, de los cuales USD 1.123.800[1158] corresponden a la reducción de la vida útil del motor, para la cual Ecuador estima una reducción del 30%[1159], debido a la falta de mantención regular y al uso de la mezcla de diésel y crudo. Sin embargo, dado que el presente Tribunal ha rechazado previamente la afirmación de Ecuador acerca de que la presunta falta de mantenimiento regular del Consorcio redujo la vida útil de los motores, y dado que Ecuador no ha podido establecer qué proporción de la reducción de la vida útil puede atribuirse a la utilización de la mezcla, el Tribunal se encuentra, en cierto modo, en una disyuntiva. El Tribunal de *Burlingto*n, en ejercicio de sus facultades discrecionales en materia de cuantificación de daños, consideró apropiado otorgar a Ecuador la mitad del monto reclamado respecto de la reducción de la vida útil de los motores del Bloque 7 y, por consiguiente, otorgó la suma de USD 561.900[1160]. El presente Tribunal no se encuentra obligado a ejercer su discrecionalidad exactamente de la misma manera, pero considera que es una suma razonable y otorgará USD 561.900 en relación con esta pretensión.

E. Reclamaciones relacionadas con bombas, sistemas eléctricos, equipos informáticos y mantenimiento de carreteras

1. Bombas

952. Ecuador afirma que el Consorcio operó con muy pocas bombas y que aquellas que empleó eran obsoletas, no realizó un mantenimiento preventivo o predictivo, no contaba con sistemas de respaldo suficientes o carecía de ellos, y carecía del inventario necesario de piezas de reposición[1161]. Aduce que cuando Petroamazonas tomó posesión de los Bloques

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1158 Memorial Suplementario sobre Reconvenciones de Ecuador, párr. 411.

1159 Réplica sobre Reconvenciones de Ecuador, párr. 526.

1160 Decisión sobre Reconvenciones, párr. 1039.

1161 Luna WS III, párrs. 123-129.

debió adquirir bombas nuevas para reemplazar aquellas en existencia en ese entonces. Sin embargo, no existen pruebas de que haya reemplazado las bombas y en ese entonces había realizado reacondicionamiento en las bombas 2 y 4 de Coco CPF cuyo costo, alegó, fue de USD 33.662,45[1162].

953. Esta reclamación carece de sustento, ya que durante cierto tiempo luego de la toma de posesión de los Bloques, Ecuador todavía operaba las bombas que ahora alega son obsoletas, salvo por dos bombas en Coca CPF. En relación con estas dos bombas, Ecuador efectivamente realizó reacondicionamientos por el costo expuesto *supra* objeto de la presente reclamación. Como señaló el tribunal de *Burlington*, el hecho de que 158 de las 160 bombas que se encontraban presentes en los Bloques cuando Petroamazonas asumió el control de las operaciones en julio de 2009 no hayan sido reacondicionadas ni reemplazadas con posterioridad a la toma de posesión, lleva al Tribunal a inferir que estas bombas no se encontraban en el grave estado que alega Ecuador[1163]. Luego de considerar esta cuestión nuevamente, el presente Tribunal concuerda con el tribunal de *Burlington*.

954. En cuanto a las dos bombas reacondicionadas, el informe que Ecuador invoca data de septiembre de 2012, tres años después de que Petroamazonas se hiciera cargo[1164]. Esto no resulta de ayuda para el Tribunal a la hora de evaluar el estado de las bombas en el mes de julio de 2009.

955. Se desestima esta reclamación.

2. Sistemas eléctricos

956. De igual modo que el tribunal de *Burlington*[1165], el Tribunal desestima esta reclamación por falta de pruebas de que los gastos relacionados con la compra de los nuevos variadores fueron causados por el mantenimiento inapropiado por parte del Consorcio, o por una mala

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1162 Véase Réplica sobre Reconvenciones de Ecuador, párr. 519, que hace referencia a Luna WS III, Anexo 78.

1163 Decisión sobre Reconvenciones, párr. 1044.

1164 Luna WS III, Anexo 79.

1165 Decisión sobre Reconvenciones de *Burlington*, párrs. 1049-1051.

condición más allá del desgaste normal de los sistemas eléctricos de los Bloques a julio de 2009.

3. Equipos y software informáticos

957. La reclamación respecto de esta pretensión consiste en que el Consorcio no tenía un software de mantenimiento apropiado de acuerdo con los estándares de la industria. Por consiguiente, después de la toma de control, Petroamazonas incurrió en gastos a fin de actualizar la tecnología utilizada en sus oficinas e implementó "Maximo", un nuevo Sistema computarizado de gestión del mantenimiento (CMMS, por sus siglas en inglés). El Sr. Luna calculó esta reclamación en USD 151.601,96, incluida la adquisición de computadoras, cámaras y el costo de contratación de personal especializado para implementar el sistema[1166]. Si se excluye la compra de computadoras, Ecuador calcula esta reclamación en USD 81.384,96[1167].

958. La reclamación por USD 151.601,96 carece de sustento. El Consorcio utilizaba el otro programa de gestión, el sistema SAP, que el Dr. Egan caracteriza como un *"sistema de gestión internacionalmente reconocido"*[1168], *"integral"*[1169] y que cumple con los estándares de la industria.

959. Ecuador no cuestiona esto, pero sostiene que el Consorcio no proporcionó ni ofreció acceso a los datos de mantenimiento de SAP cuando se retiró de los Bloques y, por ende, Petroamazonas tuvo que adquirir el sistema Maximo desde cero[1170]. Si bien el tribunal de *Burlington* invocó una carta escrita por el Consorcio a Petroamazonas de fecha 23 de julio de 2009 para "*proponer una reunión técnica en aras de garantizar una ordenada transición posterior a la toma de posesión*" [Traducción del Tribunal], la carta, de hecho, se refería a

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1166 Memorial Suplementario sobre Reconvenciones de Ecuador, párr. 414.

1167 *Id.*

1168 Intertek ER I, párr. 48.

1169 *Ibid.*, párr. 51.

1170 Luna WS III, párr. 45, en respuesta a Sr. d'Argentré WS III, párr. 36: *"Ecuador omite el hecho de que el Consorcio estaba dispuesto a transferir todos sus registros de mantenimiento de una forma ordenada"*. [Traducción del Tribunal]

la transición de empleados y contratistas y no específicamente a la del sistema. En este contexto, el Tribunal otorga la suma de USD 81.384,96.

F. Mantenimiento de caminos y vehículos

960. Ecuador pretende recuperar los montos invertidos en la compra de nuevos vehículos (USD 98.187,16) y mantenimiento de caminos (USD 381.127,64)[1171]. El Tribunal observa que Ecuador no ha aportado pruebas documentales que sustenten la necesidad de reparar o reemplazar determinados vehículos. Sin embargo, señala que los informes SGS identifican al menos dos vehículos, ambos Toyota Landcruisers, que se encontraban ya sea en condiciones "*muy malas*", o en condiciones "*buenas*" pero averiados[1172]. El tribunal de *Burlington* fue de la opinión que, como Ecuador reclama el costo de compra de cuatro vehículos similares por un total de USD 98.187,16, dicho tribunal debería concederle a Ecuador la mitad de esta reclamación; a saber, USD 49.093,58. En opinión del presente Tribunal, el hecho de que Ecuador no haya presentado ninguna prueba documental que avale la necesidad de reparar o reemplazar vehículos específicos es suficiente para que se desestime esta reclamación. Por consiguiente, este Tribunal no actuará de la misma forma que el tribunal de *Burlington*, que concedió la mitad de la reclamación, a saber, USD 49.093,58.

961. Se desestima la reclamación respecto del mantenimiento de caminos y vehículos por falta de pruebas acerca de que estos gastos fueron provocados debido a la negligencia del Consorcio.

G. Otras reclamaciones

962. Ecuador también solicita indemnización por otras reparaciones y la actualización de las instalaciones, y por la compra de equipos auxiliares, piezas de reposición y materiales a fin de adecuar las operaciones de los Bloques a los estándares de la industria. Estas obras

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1171 E-211.

1172 CE-CC-217, CE-CC-240.

incluyen el reacondicionamiento de pozos, la renovación de campos y una nueva torre de comunicaciones en Gacela CPF[1173].

963. El Tribunal considera que estas reclamaciones no han sido suficientemente particularizadas o probadas por Ecuador. El Tribunal está convencido de que la infraestructura de los Bloques se encontraba generalmente en buenas condiciones y de que el plan de expansión de Ecuador y aumentos en la producción probablemente exigirían mejoras en los equipos e instalaciones existentes en cualquier caso. Por consiguiente, se rechazan estas reclamaciones adicionales.

H. Conclusión sobre Daños y Perjuicios Relacionados con la Reconvención sobre Infraestructura

964. Por los motivos expuestos *supra*, el Tribunal concluye que otorgará un total de USD 2.315.969,15 en relación con las reconvenciones sobre infraestructura de Ecuador, desglosado de la siguiente manera:

(a) USD 210.130,76 por el tanque Payamino T-102;

(b) USD 1.462.553,43 por reparaciones relativas a oleoductos y líneas de fluidos;

(c) USD 561.900 por motores de generación; y

(d) USD 81.384,96 por equipos y software informáticos.

965. El Tribunal procederá ahora a abordar la doble recuperación. No existe controversia entre las Partes respecto de que Ecuador solo puede recuperar esta suma o recibir el beneficio de ella una sola vez[1174].

966. Dado que Burlington y Ecuador han resuelto sus diferencias mediante el pago total del Laudo de *Burlington*, que incluía USD 2.577.119 en relación con la reconvención sobre infraestructura de Ecuador (en otras palabras, se realizó una deducción de la indemnización por daños y perjuicios de Burlington), a juicio del presente Tribunal, no es correcto

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1173 Véase, por ejemplo, Montenegro WS III, párr. 7; véase también E-211.

1174 Véase párr. 906 *supra*. Asimismo, véanse generalmente Primera y Segunda Solicitud de Desestimación de las Reconvenciones de Ecuador.

conceder la misma suma o parte de ella dos veces. Por ende, consecuente con lo acordado por Ecuador acerca de no pretender doble recuperación, el presente Tribunal determina que, dado que la indemnización por daños y perjuicios de *Burlington* es más alta que la suma otorgada por este Tribunal, Ecuador ha sido indemnizado en relación con la reconvención sobre infraestructura y esta suma no debe incluirse como parte de la indemnización por daños y perjuicios en relación con la reconvención de Ecuador.

V. COSTOS

967. Tal como demuestran con claridad los antecedentes procesales del presente arbitraje, el procedimiento ha sido extenso, complejo, multifacético, demandante en términos de esfuerzo y muy oneroso. Las partes efectuaron sus Presentaciones sobre Costos el 19 de abril de 2019 y sus respectivas Réplicas sobre Costos el 10 de mayo de 2019.

968. Perenco reclama el importe total de USD 57.923.332[1175] en concepto de costos legales y otros gastos del presente arbitraje como establece el Anexo de Costos y Honorarios actualizado de la Demandante que se adjunta a su Réplica sobre Costos de 10 de mayo de 2019[1176].

Fase	Honorarios	Honorarios del Perito Independiente	Costos	Total
Solicitud de Arbitraje, Medidas Provisionales, Jurisdicción	USD 4.922.728	USD 225.986	USD 1.045.017	USD 6.193.731
Responsabilidad, Solicitud de Reconsideración	USD 6.619.023	USD 1.736.450	USD 1.551.189	USD 9.906.662
Quantum	USD 7.029.649	USD 5.115.861	USD 1.161.750	USD 13.307.260
Reclamaciones Principales	**USD 18.571.400**	**USD 7.078.297**	**USD 3.757.956**	**USD 29.407.653**
Reconvenciones	**USD 11.881.356**	**USD 9.178.588**	**USD 3.005.809**	**USD 24.065.753**

1175 Este importe excluye los anticipos al CIADI y honorarios por un total de USD 4.799.900.00.

1176 Perenco en su Presentación sobre Costos, de fecha 19 de abril de 2019, reclamó originalmente el importe total de USD 57.920.021 en concepto de costos y honorarios.

969. Ecuador reclama el importe total de USD 31.620.369,27[1177] en concepto de costos legales y otros gastos del presente arbitraje, y una suma total de USD 49.629,76 en concepto de costos legales y otros gastos correspondientes a Petroecuador en el presente arbitraje. El desglose detallado se presenta en el Anexo A de sus Presentaciones sobre Costos de 19 de abril de 2019.

FASE	HONORARIOS (INCLUSO PROCURADURÍA GENERAL DEL ESTADO)	HONORARIOS Y COSTOS DEL PERITO INDEPENDIENTE	COSTOS	TOTAL
Solicitud de Arbitraje, Medidas Provisionales, Jurisdicción	USD 2.787.393,80	USD 33.237,91	USD 232.697,14	USD 3.053.328,85
Responsabilidad, Solicitud de Reconsideración	USD 4.212.798,50	USD 1.058.867,79	USD 480.065,83	USD 5.751.732,12
Quantum	USD 3.911.825,68	USD 3.672.886,85	USD 589.201,20	USD 8.173.913,73
Reclamaciones Principales	**USD 10.912.017,98**	**USD 4.764.992,55**	**USD 1.301.964,17**	**USD 16.978.974,70**
Reconvenciones	**USD 5.284.433,84**	**USD 3.859.326,13**	**USD 991.719,98**	**USD 10.135.479,95**

970. Ambas Partes reclamaron sus costos fundadas en la suposición de que se constituirían en la parte vencedora.

971. El punto de partida para cualquier consideración en materia de costos es el Artículo 61(2) del Convenio del CIADI el cual faculta al Tribunal a determinar "salvo acuerdo contrario de las partes, los gastos en que estas hubieren incurrido en el procedimiento, y decidirá la forma de pago y la manera de distribución de tales gastos, de los honorarios y gastos de los

[1177] Esta cantidad incluye los pagos anticipados al CIADI por USD 4.500.000.00, así como una cuota administrativa de la CPA por US 5.914.62. Esta cantidad excluye el pago anticipado de Ecuador al CIADI por USD 300.000 el cual fue recibido después de las presentaciones sobre costos. Ecuador ha realizado pagos anticipados al CIADI por un total de USD 4.800.000.00.

miembros del Tribunal y de los derechos devengados por la utilización del Centro". El Tribunal ha tenido que considerar no sólo las reclamaciones en virtud del Tratado de Perenco sino también las reclamaciones de ambas Partes con arreglo a los Contratos de Participación, y las reclamaciones de Ecuador adoptaron la forma de reconvenciones.

972. Los Contratos de Participación disponen que cada una de las Partes debe sufragar los honorarios del Árbitro que nombran, dividir en partes iguales los honorarios del Árbitro Presidente, y abonar todos los gastos en los que se incurriera en el arbitraje según la determinación del Tribunal.

973. En sus escritos, Perenco señala lo siguiente: "Los Contratos de Participación de los Bloques 7 y 21 disponen un método de distribución de costos que, con algunas excepciones, es consistente, en términos generales, con la norma por defecto con arreglo al Convenio del CIADI respecto de la cual el Tribunal goza de discreción para asignar los costos, salvo los honorarios de los árbitros y los costos la utilización de las instalaciones del CIADI"[1178]. Sin embargo, alega que "[l]as reclamaciones en virtud de los contratos. . . agregaron ciertos costos incrementales a la reclamación en virtud del Tratado" y que "[p]or lo tanto, no resulta prudente asignar los honorarios de los árbitros. . . conforme a los Contratos de Participación"[1179] Ecuador coincide[1180]. A la luz del acuerdo de las Partes, el Tribunal no aplicará el enfoque de los Contratos de Participación respecto de la distribución de los honorarios de los árbitros.

974. El Tribunal considera que los tribunales toman en cuenta, por lo general, tres factores para la determinación de la cuestión de costos.

i. En primer lugar, el éxito de las partes sobre sus respectivas reclamaciones o reconvenciones;

ii. En segundo lugar, su conducta procesal a lo largo del arbitraje; y

iii. En tercer lugar, la razonabilidad de los costos que efectivamente reclaman.

1178 Presentación sobre Costos de Perenco, párr. 6. [Traducción del Tribunal]

1179 *Ibid.* [Traducción del Tribunal]

1180 Réplica sobre Costos de Ecuador, párr. 2.

975. Se encuentra bien establecido que los árbitros en casos en virtud del CIADI gozan de una amplia discreción y no hay suposiciones refutables como ocurre con otras normas en las cuales los costos siguen el resultado.

976. Una de las Partes, o la contraparte, arguye que hay una diversidad de características en el presente caso que han tenido un impacto en los costos del presente procedimiento y que el Tribunal debería considerar. El Tribunal considerará cada una de ellas de forma separada y emitirá su decisión respecto de si tienen algún mérito y, en ese caso, si son relevantes para el laudo sobre costos del presente procedimiento.

A. Ecuador se negó a dar cumplimiento a la Decisión del Tribunal sobre las Medidas Provisionales

977. Perenco alega que la decisión de Ecuador de no cumplir con la Decisión del Tribunal sobre Medidas Provisionales, de fecha 8 de mayo de 2009, modificó significativamente las características del arbitraje y contribuyó a su complejidad, extensión y costo[1181].

978. En el párrafo 695 de su Decisión sobre la Responsabilidad, el Tribunal observó lo siguiente:

> "El Tribunal recomendó lo que consideraba una forma razonable de proteger los derechos de ambas partes antes de arribar a una resolución definitiva de la diferencia. Lamentablemente, esto no fue posible a la luz de las circunstancias. Perenco acertadamente señala que si el Estado hubiera optado por no actuar en relación con las coactivas, la disputa no se habría agravado en la forma en que se agravó"[1182]. [Énfasis agregado].

979. El Tribunal puede ir más allá, ahora que el caso está próximo a concluir, y una vez revisados los antecedentes de la controversia en el curso de las deliberaciones finales llevadas a cabo en virtud de la elaboración del presente Laudo. En el momento en el cual, a pesar de las medidas provisionales, la Demandada amenazó con proceder con las *coactivas*, el Tribunal dejó en claro a Ecuador que el Tribunal *"debía mirar con suma gravedad cualquier negativa a cumplir"*[1183]con la determinación de sus medidas provisionales. El Tribunal

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1181 Presentación sobre Costos de Perenco, párrs. 3 y 21-25.

1182 Decisión sobre las Cuestiones Pendientes Relativas a la Jurisdicción y sobre la Responsabilidad, párr. 695.

1183 *Ibid.*, párr. 158, que cita, de la carta del Tribunal de 27 de febrero de 2009, su lamento relativo a la posición adoptada por Ecuador respecto de las Medidas Provisionales (CE-204).

había considerado minuciosamente un medio que permitiría que permitirían a las Partes continuar con el arbitraje sin poner en riesgo los fundamentos de su relación contractual y agravar la controversia. La cuenta de depósito en garantía, que Perenco propuso y el Tribunal consideró que podría actuar razonablemente como protección de los derechos fiscales de la Demandada, habría hecho que la totalidad de la deuda cuestionada en virtud de la Ley 42 fuera abonada en una cuenta y pagadera a Ecuador si prevalecía sobre el fondo. Lamentablemente, Ecuador no consideró apropiado negociar un acuerdo de cuenta de depósito en garantía y, en cambio, comenzó con las *coactivas*[1184]. Ello derivó en una serie de eventos que culminaron en la ruptura total de la relación entre las Partes.

980. Independientemente de los motivos por los cuales Ecuador no dio cumplimiento a la Decisión del Tribunal sobre Medidas Provisionales, la cuestión radica en que su negativa modificó la naturaleza del presente arbitraje en detrimento de Perenco. Si Ecuador hubiera cumplido con dicha orden, el presente arbitraje habría sido, probablemente, muy diferente. A saber:

(a) Sería probable que Perenco estuviera todavía a cargo de la operación de los Bloques;

(b) Sin *coactivas*, probablemente no hubiera habido suspensión de las operaciones y, por lo tanto, tampoco declaración de caducidad;

(c) El derecho de operación del Bloque 7 probablemente se habría prorrogado en una nueva forma contractual en virtud de términos aceptados de mutuo acuerdo;

(d) La reclamación de daños conforme a la Ley 42 habría sido relativamente directa;

(e) Las pruebas en materia contable habrían sido mucho más directas;

(f) Tanto la fase de responsabilidad como la de *quantum* habrían sido menos extensas y onerosas;

1184 *Ibid.*, párr. 170.

(g) Muy probablemente no se hubiera presentado una reconvención ya que no se habrían comprometido las disposiciones posteriores a la extinción, contempladas en los Contratos de Participación; Perenco, en su calidad de operador actual, habría tenido un incentivo comercial para reinvertir en mantenimiento de infraestructura y protección ambiental; como ello no ocurrió, Ecuador disponía de los recursos contractuales y legales suficientes para exigir lo precedente;

(h) El presente arbitraje no se habría extendido durante 11 años;

(i) No se hubieran requerido más de 50 escritos y siete audiencias; y

(j) El costo total para ambas Partes se hubiera reducido significativamente.

981. A la luz de todo lo precedente, el Tribunal considera que resulta apropiado tomar en cuenta la conducta de Ecuador en el presente arbitraje cuando evaluó la cuestión general respecto de quién debería abonar a quien, y cuánto.

B. Excepciones a la jurisdicción planteadas por Ecuador

1. La incorporación de Petroecuador al procedimiento

982. Perenco incoó el presente procedimiento no sólo contra Ecuador sino también contra Petroecuador. Sin embargo, el Tribunal concluyó que no tenía competencia sobre Petroecuador[1185]. Petroecuador reclama el reembolso de los costos en concepto de representación legal y gastos incurridos por la suma de USD 49.629,76 en virtud del presente arbitraje, con interés simple a una tasa comercialmente razonable desde el momento en el que se incurrieron los costos hasta su fecha de pago[1186].

983. El Tribunal considera que dicho valor es razonable y, en consecuencia, ordenará a Perenco el pago a Petroecuador de USD 49.629,76, más el interés simple a una tasa anual del 3%

1185 Decisión sobre Jurisdicción, párr. 242(3).

1186 Presentación sobre Costos de Ecuador y Petroecuador, párrs. 8 y 41(a).

que devengará desde el 30 de junio de 2011 (fecha de envío de la Decisión del Tribunal sobre Jurisdicción) hasta la fecha de pago total y definitivo.

2. Excepciones a la jurisdicción

984. Ecuador también planteó excepciones a la jurisdicción del Tribunal para oír las reclamaciones. El Tribunal consideró necesario analizar las cuestiones jurisdiccionales en dos etapas (la emisión de la Decisión sobre Jurisdicción y luego, con posterioridad a la recepción de pruebas y escritos adicionales, la Decisión sobre las Cuestiones Pendientes Relativas a la Jurisdicción y sobre la Responsabilidad). El Tribunal no considera que las excepciones sean frívolas y el interés de Ecuador en que el Tribunal determinara si la reclamación principal podría proceder era totalmente comprensible. No obstante, y en última instancia, Perenco prevaleció en prácticamente todas las cuestiones jurisdiccionales salvo la correspondiente a Petroecuador y la reclamación en virtud de la declaración de caducidad del Contrato del Bloque 7. Ello será considerado en el laudo sobre costos.

C. Perenco percibió menos de lo reclamado

985. Ecuador sugiere que el Tribunal puede considerar el hecho de que Perenco "infl[ó] groseramente" [Traducción del Tribunal] su reclamación[1187]. Es cierto que Perenco reclamó la suma de USD 1.423 millones (al 18 de abril de 2016 luego de algunos ajustes al valor original de USD 1.698 millones) y, en última instancia, se le otorgaron USD 448.820.400. El Tribunal observa que es habitual que un laudo sea inferior al importe reclamado. La cuestión para el Tribunal versa sobre si la reclamación de Perenco estuvo inflada de manera irrazonable.

986. El motivo principal para un otorgamiento de daños inferior radica en que el Tribunal no podría coincidir con la alegación de Perenco de que los daños deberían calcularse fundados en que el Contrato de Participación del Bloque 7 se habría prorrogado. La decisión de otorgar daños solamente por la pérdida de oportunidad de dicha posible prórroga derivó en una reducción significativa del importe pagadero a Perenco.

[1187] Réplica sobre Costos de Ecuador, párr. 5.

987. Respecto del cálculo de daños anterior a la declaración de caducidad, y en definitiva, el Tribunal adoptó un enfoque diferente del sugerido por el Profesor Kalt, pero no concluyó que su enfoque y análisis eran frívolos. El Tribunal decidió adoptar el enfoque de 'estratificación' que resultó en un importe inferior. Las opiniones del Profesor Kalt no eran absurdas ni imaginarias. El Tribunal decidió, simplemente, que un enfoque diferente derivaba en una cifra de daños más apropiada y, aun así, sustancial.

988. Por su parte, se instruyó a los peritos en materia de *quantum* de Ecuador que fundaran sus cálculos de daños en ciertas suposiciones (no aceptadas por el Tribunal) las cuales, con ciertas excepciones importantes (tales como el enfoque de 'estratificación' para valorar los daños resultantes de los diversos incumplimientos que se sucedieron en momentos diferentes, el 'ajuste' y el 'Gráfico de Cascada') impidieron que sus informes escritos elaborados durante la fase de *quantum* del procedimiento asistieran al Tribunal de forma correcta. En virtud de dichas instrucciones, el Profesor Dow y su equipo concluyeron de forma sorprendente que Perenco no había sufrido ninguna pérdida y, de hecho, estaba en deuda con Ecuador. No hay intención de faltar el respeto a Brattle por la formulación de dicha observación. Sin embargo, en última instancia, el Tribunal considera que los peritos de ambas Partes le prestaron asistencia útil; el problema fue que durante la fase inicial de *quantum*, Brattle procedió según instrucciones que no se correspondían con los hechos relevantes tal como fueran decididos por el Tribunal, con resultados previsibles en términos de persuasión de sus estimaciones iniciales de daños.

989. Ecuador presentó una solicitud de reconsideración de la Decisión sobre la Responsabilidad del Tribunal la cual fue desestimada por el Tribunal[1188] y Ecuador debería sufragar los costos de Perenco relativos a dicha cuestión. Perenco no los especificó de forma separada pero fueron incluidos como parte de los Costos sobre Responsabilidad y Solicitud de Reconsideración. Están incluidos en el importe que el Tribunal otorgara a Perenco por sus costos relativos a la reclamación principal.

[1188] Véase Decisión sobre la Solicitud de Reconsideración de Ecuador.

990. A la luz de lo precedente, el Tribunal entiende que Perenco tiene derecho al reembolso de sus costos por la prosecución satisfactoria de sus reclamaciones en contra de Ecuador. Sin embargo, el Tribunal considera que el reembolso debería reducirse a un nivel razonable de dichos costos, tomando en cuenta, en particular, que no todos los informes periciales contribuyeron a que el Tribunal arribara a su decisión. Por lo tanto, y de los USD 29.407.653 en concepto de costos totales en los que Perenco incurrió en virtud de las Reclamaciones Principales, el Tribunal decide que Ecuador debe reembolsar a Perenco la suma de USD 23 millones.

D. Las reconvenciones de Ecuador en contra de Burlington y Perenco

991. Burlington y Perenco eran los contratistas con responsabilidad solidaria respecto de los Bloques 7 y 21. Se hacía referencia a ellos como "el Consorcio" y Perenco gestionaba los Bloques en representación del Consorcio.

992. Tanto Burlington como Perenco incoaron reclamaciones en virtud del tratado en contra de Ecuador (con arreglo a tratados diferentes) y las reclamaciones contractuales conforme a los mismos Contratos de Participación. La Solicitud de Arbitraje de Burlington fue presentada el 21 de abril de 2008 y la correspondiente a Perenco, el 30 de abril de 2008. Sin embargo, Burlington retiró sus reclamaciones contractuales el 6 de noviembre de 2009[1189].

993. En cada uno de los arbitrajes, Ecuador presentó reconvenciones en las cuales procuraba una indemnización sustancial por daños ambientales en algunas partes del bosque tropical amazónico afectadas, de hecho, por los trabajos de Perenco, así como en concepto de daños por la supuesta falta del retorno de la infraestructura de los Bloques en condiciones razonables tal como exigían los Contratos de Participación. Ecuador planteó sus reconvenciones en contra de Burlington el 17 de enero de 2011 y luego, el 5 de diciembre de 2011, planteó las mismas reconvenciones en contra de Perenco.

[1189] *Burlington Resources, Inc. c. República de Ecuador*, Caso CIADI No. ARB/08/5, Decisión sobre Jurisdicción, 2 de junio de 2010, párrs. 76-80.

994. Las reconvenciones plantean tres cuestiones: (i) la cuestión de la duplicación de procedimientos; (ii) la estimación inicial de la magnitud del daño ambiental; y (iii) la proporcionalidad de aquello que fuera efectivamente otorgado respecto de lo inicialmente reclamado.

1. Duplicación de procedimientos

995. El 24 de junio de 2011, el abogado de Perenco se dirigió por escrito al abogado de la Demandada sugiriendo que Ecuador podría ahorrarse importantes sumas de dinero si mantenía reconvenciones sólo en el procedimiento de *Burlington*, y sugería, además, las formas en las cuales se podría llevar adelante.

996. El 29 de junio de 2011, la Demandada rechazó esta sugerencia e invocó el hecho de que tanto Burlington como Perenco habían considerado apropiada la interposición de sus propios procedimientos y, por ende, las dos reconvenciones eran consecuencia de ello. Perenco aceptó dicha posición; no consideraba pertinente oponerse a la reconvención de *Perenco* fundada en admisibilidad[1190] o materia jurisdiccional y durante alrededor de seis años las reconvenciones de *Burlington* y *Perenco* prosiguieron de forma independiente.

997. Por ende, la cuestión radica en si Ecuador ha complicado los procedimientos de forma irrazonable y, por lo tanto, exacerbado los costos y la demora por el hecho de reclamar los mismos daños tanto para Burlington como Perenco en dos procedimientos de arbitraje diferentes. La reconvención planteada por Ecuador podría haberse mantenido en contra de Burlington solamente, o Perenco solamente. En el primer caso, Perenco habría sido responsable de indemnizar a Burlington por el 50% de los daños probados en calidad de co-contratista responsable solidario. En el segundo caso, Burlington habría sido responsable de indemnizar a Perenco por el 50% de los daños probados en calidad de co-contratista responsable solidario.

[1190] Ello significa, al menos hasta dos solicitudes - de fecha 18 de abril de 2017 y 30 de enero de 2018, respectivamente - desestimar la reconvención fundada en *res judicata.*

998. ¿Era la intención de Ecuador tener una doble oportunidad?

999. Los costos de la audiencia sobre reconvención de *Burlington* fueron significativos y resultaron en un laudo en favor de Ecuador por la suma de casi USD 42 millones respecto de la reclamación planteada de USD 2.797.007.091,42[1191]. Las mismas reclamaciones fueron planteadas en contra de Perenco y, tal como se observará *infra*, ello ha resultado en un Laudo en favor de Ecuador por la suma de USD 93.683.890 respecto de la cual el importe de USD 39.199.373 otorgado en la Decisión sobre Reconvenciones de *Burlington* y abonada por Burlington ha de deducirse para evitar la doble recuperación.[1192]

1000. En consecuencia, el Tribunal necesita decidir si las reconvenciones en contra de Perenco han incrementado los costos porque ello podría haberse analizado solamente en el procedimiento de *Burlington*.

1001. No hay dudas de que la presentación de dos reconvenciones fundadas en el mismo objeto fue planeada para incrementar las posibilidades generales de éxito de Ecuador. Sin embargo, y como observara el Tribunal previamente, se ha determinado que los procedimientos de arbitraje paralelos en virtud de tratados de inversión incoados por las demandantes (en ocasiones de forma conjunta con reclamaciones comerciales relativas a los mismos hechos) no son abusivos, incluso si hubiera un elemento que procura la obtención de una doble oportunidad[1193].

1002. En efecto, y en la medida en que las cuestiones sobre reconvenciones fueran las mismas en ambos procedimientos, la pregunta real es por qué Ecuador plantearía como mínimo una reconvención en contra de Burlington si Perenco era el operador, la parte que tenía de primera mano el conocimiento de las operaciones y, por lo tanto, el autor real (en oposición al nominal) de cierto grado de contaminación que el Perito Independiente del Tribunal ha encontrado en los yacimientos.

1191 Decisión sobre Reconvenciones en el caso *Burlington c. Ecuador*, párr. 52(iii).

1192 El laudo Burlington, en particular la Decisión sobre reconvenciones, párrafo 52(iii), que es parte integrante del laudo Burlington.

1193 Los casos *CME* y *Lauder* constituyen ejemplos principales.

1003. Si Ecuador hubiera procedido con la intención de procurar una reparación de la forma más efectiva, Burlington habría retenido los costos de defensa de sí misma en contra de las reclamaciones planteadas respecto de las acciones del operador del Consorcio. Pero ello, en última instancia, no juega ningún rol en el cálculo de costos del presente procedimiento. Por los motivos recientemente expuestos, resulta lógico que Ecuador debería haber procedido en contra de Perenco, no de Burlington, y cualquier costo que arrojara el arbitraje de *Burlington* no es relevante para la atribución de responsabilidad en materia de costos del presente procedimiento.

1004. El Tribunal ha sostenido previamente, y por mayoría, que - conforme a la ley ecuatoriana y el derecho internacional - Ecuador tenía derecho de presentar reconvenciones en contra de ambos miembros del Consorcio y, según su opinión, el ejercicio de dicho derecho por parte de Ecuador no tuvo carácter abusivo. Esta opinión fue compartida, evidentemente, por el tribunal en *Burlington*, porque no tuvo la intención de resolver que su laudo sobre daños en favor de Ecuador puso fin, en consecuencia, a las reconvenciones existentes. Por el contrario, tal como se analizara previamente, dicho tribunal dejó para este Tribunal, en calidad de tribunal ulterior en el tiempo la resolución de la cuestión de la doble recuperación.

1005. El Tribunal considera que la presentación de reconvenciones en ambos procedimientos no era necesaria porque, tal como se indicara *supra*, se podrían haber planteado en un solo procedimiento. Sin embargo, Ecuador ejerció sus derechos, ya que estaba facultado para ello, y resistió los intentos de Perenco de consolidación de las reconvenciones.

1006. El Tribunal concluye que el mantenimiento de ambas reconvenciones constituyó el intento (exitoso como realmente fue) de contar con una doble posibilidad. Fue una forma de obtención de la decisión ineficiente, onerosa y que insumió mucho tiempo. Pero Ecuador tenía el derecho de incoar ambos procedimientos y Perenco no planteó ninguna objeción hasta que fue demasiado tarde en el proceso.

2. La estimación del daño ambiental

1007. Tal como se ha visto, las reconvenciones presentadas en contra de Perenco tenían una historia extensa detrás. Al final de la audiencia sobre las reconvenciones, el Tribunal decidió que no estaba dispuesto a aceptar las conclusiones de ninguno de los peritos principales en materia ambiental de las partes y ordenó la confección de un informe independiente al Perito Independiente del Tribunal, el Sr. MacDonald, lo que finalmente resultó en el dictado de un Laudo a favor de Ecuador. Basado en la evidencia disponible ante sí, el Tribunal creía que habría una contaminación por la cual se responsabilizaría a Perenco[1194], y el total de la indemnización otorgada ha resultado significativo.

1008. El Tribunal no ha perdido de vista el hecho de que Perenco, en un principio, sostuvo que el reclamo ambiental debía desestimarse "en su totalidad … con costas [otorgadas] a su favor . . . [y con] la reparación que el Tribunal considerara justa y apropiada"[1195].

1009. A su vez, también tal como lo anticipara el Tribunal[1196], la suma otorgada por el Tribunal no se acerca en lo más mínimo a lo reclamado por Ecuador originalmente en el procedimiento (cuantificado en USD 2.279.544.559 en concepto de costos de limpieza de suelo, USD 265.601.700 en concepto de costos de remediación de las aguas subterráneas y USD 3.380.000 en concepto de estudios adicionales de aguas subterráneas (sujeto al pago de intereses compuestos a la fecha del Laudo hasta la fecha de pago efectivo)[1197].

1010. Puesto que el monto de los reclamos de Ecuador realmente superaba los USD 2.500 millones, Perenco tuvo que tomarlos, en efecto, muy seriamente. La reconvención ambiental había sido anticipada por acusaciones exageradas de una catástrofe ambiental. Se basó en criterios que diferían del marco normativo ecuatoriano real e incluyó costos de remediación inflados de otro país.

1194 Decisión Provisional sobre la Reconvención Ambiental, párr. 582.

1195 *Ibid.*, párr. 43.

1196 *Ibid.*, párr.593.

1197 *Ibid.*, párr.36.

1011. A su vez, Perenco no se hizo ningún favor al pretender que se desestime la reconvención "*en su totalidad*" y reconocer lo más a regañadientes posible una mínima responsabilidad ambiental de su parte. Mientras que podría acusarse a los peritos de Ecuador de "evadir sus deberes" con relación al reclamo, podría acusarse a los peritos de Perenco de "fugarse de sus deberes" respecto de este último [Traducción del Tribunal], por encontrar en cada ocasión una oportunidad para ignorar o reducir su eventual responsabilidad.

1012. En síntesis, ninguno de los peritos ambientales principales se ganó la confianza del Tribunal[1198]. Por dicho motivo, el Tribunal ordenará que cada parte sufrague los honorarios de sus peritos ambientales.

1013. Al final de la primera audiencia sobre las reconvenciones, si bien no podía plenamente confiarse de los elementos de prueba aportados por Ecuador, el Tribunal consideró que casi seguramente se había producido alguna contaminación, cuyo responsable era Perenco. Además, ciertos elementos de prueba aportados por la propia Perenco preocupaban al Tribunal[1199]. Por este motivo, el Tribunal alentó a las Partes a que arribaran a un acuerdo sobre la reconvención ambiental sobre la base de las determinaciones de hecho y derecho que había plasmado en la Decisión Provisional, sobre la Reconvención teniendo en cuenta la posibilidad de que, si no llegaban a un acuerdo, se nombraría un perito independiente.

1198 Salvo por el Dr. Rouhani, cuyo testimonio pericial resultó útil para el Tribunal.

1199 El "Memorando Jungal" de mayo de 2010: que fuera confeccionado por Perenco y que versa sobre la caracterización de las cuestiones ambientales en Payamino 2-8, cuando Perenco y un terrateniente, pero no así las autoridades ecuatorianas, tenían conocimiento de la condición en la que se encontraba la zona del pantano contaminado, y los funcionarios de la compañía se debatían qué hacer, como ejemplo principal. En el párr. 438 de la Decisión Provisional se volvieron a exponer las opciones incluidas en el memorando:

438. El memorando luego exponía "posibles soluciones" al problema que incluían una "remediación convencional" del lugar, "confinar el problema y justificar su permanencia", "desestimar el pendiente" (que, según se señalaba, podía derivar en un reclamo legal de "indemnizaciones millonarias" y que podía hacer que el Estado "nos obligue a remediar el sitio en base a sus condiciones" en una situación en la que "el costo ascenderá a cifras muy difíciles de estimar ahora" y "el costo de imagen de Perenco va a ser también muy alto").

El memorando señalaba lo siguiente: "[P]robablemente el Estado va a asumir que estamos escondiendo muchos más pasivos [ambientales] y escudrinarán el área de operaciones en busca de otros pasivos y probablemente van a encontrar".

Citado en el párr. 439 de la Decisión Provisional.

Al final, Ecuador se vio beneficiado por esta decisión, en el sentido de que pudo basarse en las posteriores conclusiones del Perito Independiente[1200].

1014. Puesto que Ecuador, en última instancia, prevaleció con respecto a las reconvenciones ambientales, aunque se le haya otorgado una indemnización mucho menor que la pretendida originalmente, se ordenará que se le pague una porción de sus costos. El Laudo no incluye los honorarios y gastos del perito de Ecuador puesto que los informes de su perito en materia ambiental no asistieron al Tribunal en su tarea y este último tuvo que nombrar al Perito Independiente.

3. Desproporcionalidad entre el monto reclamado y el monto otorgado

1015. El tribunal de *Burlington* otorgó a Ecuador la suma de USD 41.776.492,77 en ocasión de sus reconvenciones[1201]. Este Tribunal ha ordenado una indemnización de USD 93.683.890 por la reconvención ambiental (y ha afirmado que el laudo del tribunal Burlington ya ha compensado plenamente a Ecuador). En este sentido, hay una diferencia sustancial entre el monto reclamado por Ecuador y el monto efectivamente recuperado. En opinión del Tribunal, las reconvenciones fueron exageradas, especialmente la reconvención ambiental, que se basó en varias premisas incorrectas. El Tribunal está convencido de que el altísimo monto exigido por Ecuador en sus reconvenciones ha incrementado sustancialmente los costos de este procedimiento. Tal como se observara *supra*, las reconvenciones probablemente no se habrían planteado si Ecuador hubiere cumplido la Decisión sobre Medidas Provisionales. .

1016. Las dos Solicitudes de Perenco de Desestimación de las Reconvenciones de Ecuador no prosperaron[1202] y no hay justificación para que Perenco no cubra los costos derivados de estas últimas. No han sido especificadas por Ecuador de manera separada, sino que se

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1200 Incluso entonces, Ecuador persistió en su caracterización de la situación de los Bloques como una catástrofe ambiental, caracterización que Perenco objeta, en opinión del Tribunal, con razón.

1201 Véase Decisión sobre Reconvenciones de *Burlington*, párr. 1099.B.

1202 Véase Decisión sobre la Solicitud de Desestimación de las Reconvenciones de Ecuador de la Demandante de fecha 18 de agosto de 2017 y este Laudo, párr. 514, *supra*.

incluyeron en los costos derivados de las reconvenciones. Forman parte de los costos que Perenco tiene que reembolsar a Ecuador con relación a las reconvenciones.

1017. A la luz de lo que antecede respecto de las reconvenciones y teniendo en cuenta el resultado al que se arribó en ese sentido, el Tribunal decide que Perenco debe reembolsar a Ecuador la suma de USD 6.276.153 por los costos en los que este último incurrió en pos de las reconvenciones.

E. Comentarios de Ecuador a las presentaciones sobre costos

1018. Finalmente, el Tribunal quedó algo sorprendido por la naturaleza, el tono y el contenido de las presentaciones sobre costos de Ecuador. Su análisis de este procedimiento, en opinión del Tribunal, no resulta realista.

1019. El argumento de que Ecuador es en efecto la parte prevaleciente de este arbitraje resulta simplemente insostenible. El argumento de Ecuador de que es la parte vencedora en este procedimiento y, de hecho, la que sufrió daños y perjuicios no es aceptado en consideración de las conclusiones anteriores del Tribunal respecto del resultado global del procedimiento.

F. Costos del procedimiento

1020. Los costos de este procedimiento, que se han cubierto por los pagos anticipados de las Partes, se exponen *infra*:

(a) Honorarios y gastos de los árbitros	USD 2.720.449,19
(b) Honorarios y gastos del Perito Independiente ambiental[1203]	USD 5.205.011,95
(c) Aranceles administrativos del CIADI	USD 324.000,00
(d) Gastos directos (estimados) [1204]	USD 1.254.592,59
TOTAL:	USD 9.504.053,73

[1203] Esta cantidad incluye los costos estimados de USD 10.000 para la eliminación de los desechos derivados de la investigación. Los costes finales se calcularán una vez que se hayan pesado y eliminados todos los residuos de acuerdo al derecho ecuatoriano. El Tribunal ha instruido al Perito Independiente a completar los arreglos con su subcontratista local para eliminar dichos desechos.

[1204] El CIADI proporcionará a las partes un estado final detallado de la cuenta del caso. El saldo restante será reembolsado a las Partes en proporción a los pagos que éstas adelantaron al CIADI.

1021. El Tribunal, teniendo en cuenta que Perenco prevaleció con respecto a su reclamo principal mientras que Ecuador prosperó en sus reconvenciones, y en ejercicio de su discrecionalidad, decide que los costos del procedimiento, incluyendo aquellos relativos al Perito Independiente del Tribunal, deberán ser cubiertos por ambas partes por igual.

VII. DECISIÓN

1022. El Tribunal incorpora por vía de referencia en este Laudo la Decisión sobre Jurisdicción de fecha 30 de junio de 2011, la Decisión sobre las Cuestiones Pendientes Relativas a la Jurisdicción y sobre Responsabilidad de fecha 12 de septiembre de 2014, la Decisión sobre Reconsideración de 10 de abril de 2015, la Decisión Provisional sobre la Reconvención Ambiental de fecha 11 de agosto de 2015, y las decisiones sobre las dos solicitudes de Perenco de desestimación de las reconvenciones de la Demandada de 18 de agosto de 2017 y 30 de julio de 2018.

1023. Por los motivos que anteceden, el Tribunal decide lo siguiente:

(a) Con motivo de los incumplimientos de sus obligaciones emanadas de los Contratos de Participación y del Tratado, la República del Ecuador deberá pagar a Perenco Ecuador Limited la suma de USD 448.820.400,00, que comprende los valores actuales netos de 2007 y 2010, más los intereses previos al juicio al 27 de septiembre. A ese monto, se acumularán los intereses posteriores al Laudo a una tasa de LIBOR para préstamos a tres meses más dos por ciento, compuestos anualmente. Los intereses posteriores al Laudo se devengarán desde el 1° de diciembre de 2019, hasta la fecha del pago final y efectivo;

(b) Perenco Ecuador Limited deberá pagar a la República del Ecuador los costos emanados de la restauración del ambiente en las áreas dentro de los Bloques 7 y 21 y deberá remediar la infraestructura en estos dos Bloques por una suma de USD 54.439.517,00.A ese monto, se acumularán los intereses posteriores al Laudo a una tasa de LIBOR para préstamos a tres meses más dos por ciento, compuestos anualmente. Los intereses posteriores al Laudo se devengarán desde el 1° de diciembre de 2019, hasta la fecha del pago final y efectivo;

(c) La República del Ecuador deberá pagar a Perenco Ecuador Limited la suma de USD 23.000.000,00 en concepto de contribución a los honorarios y gastos legales de la Demandante derivados del reclamo principal, junto con una tasa de interés simple del tres por ciento anual, que se devengará desde el 1° de diciembre de 2019, hasta la fecha del pago final y efectivo;

(d) Perenco Ecuador Limited deberá pagar a la República del Ecuador la suma de USD 6.276.153,00 en concepto de contribución a los honorarios y gastos legales de Ecuador derivados de las reconvenciones, junto con una tasa de interés simple del tres por ciento anual, que se devengará desde el 1° de diciembre de 2019, hasta la fecha del pago final y efectivo;

(e) Perenco Ecuador Limited deberá pagar a Petroecuador la suma de USD 49.629,76 con motivo de los honorarios y gastos de aquella, junto con una tasa de interés simple del tres por ciento anual, devengada desde el 30 de junio de 2011 (la fecha de envío de la Decisión sobre Jurisdicción del Tribunal) hasta la fecha del pago final y efectivo;

(f) Los costos del CIADI (con inclusión de los honorarios y gastos del Tribunal) deberán ser sufragados por ambas Partes por igual;

(g) Los costos del Perito Independiente del Tribunal deberán cubrirse por ambas Partes por igual; y

(f) Se rechaza toda otra pretensión y petitorio.

Juez Peter Tomka
Presidente del Tribunal

23 SEPTIEMBRE 2019

Sr. Neil Kaplan, C.B.E., Q.C., S.B.S.
Árbitro

16 SEPTIEMBRE 2019

Sr. J. Christopher Thomas, Q.C.
Árbitro

10 SEPTIEMBRE 2019

ANEXO A

Tabla 1. Atribución de Responsabilidades de Remediación – Sitios donde Perenco Utilizó Piscinas de Lodo y/o Instaló Pozos de Producción de Petróleo Crudo

Sitio	Costos de Remediación para las Piscinas de Lodo de Perenco	Costos de Remediación para Suelos			Costos de Remediación para Agua Subterránea	Atribución Total de Costos de Remediación				Notas/Comentarios
		Predecesores	Perenco	Sucesores		Predecesores	Perenco	Sucesores	Total	
Coca 18/19	$ 3,123.00	$ 114.08	$ 291.92	$ -	$ -	$ 114.08	$ 3,414.92	$ -	$ 3,529.00	Los suelos alrededor del pozo Coca 18 instalado por Kerr-McGee están afectados por bario solamente. Por lo tanto, esta área afectada no es atribuible a Perenco.
Condor N 1	$ 2,484.00	$ -	$ 6,339.00	$ -	$ -	$ -	$ 8,823.00	$ -	$ 8,823.00	
Jaguar 9	$ 541.00	$ -	$ -	$ -	$ -	$ -	$ 541.00	$ -	$ 541.00	
Lobo 3, 5, 6, 7	$ 101.00	$ -	$ -	$ -	$ -	$ -	$ 101.00	$ -	$ 101.00	
Oso 3-8, 13, 14	$ 1,906.00	$ -	$ -	$ -	$ -	$ -	$ 1,906.00	$ -	$ 1,906.00	
Oso 9, 12, 15-20	$ 5,317.00	$ -	$ -	$ -	$ 3,415.00	$ -	$ 8,732.00	$ -	$ 8,732.00	
Oso 9A	$ 2,948.00	$ -	$ -	$ -	$ -	$ -	$ 2,948.00	$ -	$ 2,948.00	
Oso 9B	$ 1,507.00	$ -	$ -	$ -	$ -	$ -	$ 1,507.00	$ -	$ 1,507.00	
Oso A, 21, 23	$ -	$ -	$ 228.00	$ -	$ -	$ -	$ 228.00	$ -	$ 228.00	Perenco instaló 4 de los 16 pozos (OSO-A 21, OSO-A 23, 22H y el 22). Basados en la convención de nomenclatura, todos los demás pozos (OSO-A 45, OSO-A 43, OSO-A 41, OSO-A 39, OSO-A 30, OSO-A 24, OSO-A 33, OSO-A 28, OSO-A 27, OSO-A 25, OSO-A 26, OSO-A 29, OSO-A 35) parecen haber sido instalados después de Perenco. Los excesos respecto al suelo son atribuidos a Perenco dada su detección poco después de que terminó la labor de Perenco como empresa operadora.
Payamino 16	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	Véase nota 3.
Payamino WTS	$ 2,978.00	$ -	$ 1,194.40	$ 298.60	$ -	$ -	$ 4,172.40	$ 298.60	$ 4,471.00	Basados en documentación fotográfica en los registros del Proyecto, parece haber en el sitio una utilización de una celda de suelo posterior a Perenco (como 1/5 del área total). 1/5 de los costos de remediación son atribuidos al sucesor de Perenco y 4/5 a Perenco.
Yuralpa - Chonta	$ 1,404.00	$ -	$ 645.00	$ -	$ -	$ -	$ 2,049.00	$ -	$ 2,049.00	
Yuralpa - LF	$ 12,217.00	$ -	$ -	$ -	$ -	$ -	$ 12,217.00	$ -	$ 12,217.00	Véase nota 4.
Yuralpa Pad A	$ 1,034.00	$ -	$ 202.00	$ -	$ -	$ -	$ 1,236.00	$ -	$ 1,236.00	
Yuralpa Pad B	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	Véase nota 5.
Yuralpa Pad D	$ -	$ -	$ 475.00	$ -	$ -	$ -	$ 475.00	$ -	$ 475.00	Contaminación detectada en 2010. Dos de los cinco pozos fueron instalados después de 2009. Los excesos respecto al suelo son atribuidos a Perenco dada su detección poco después de la conclusión de la actividad de Perenco como empresa operadora.
Yuralpa Pad E	$ 193.00	$ -	$ -	$ -	$ -	$ -	$ 193.00	$ -	$ 193.00	
Yuralpa Pad F, CPF	$ -	$ -	$ 98.00	$ -	$ -	$ -	$ 98.00	$ -	$ 98.00	
Yuralpa Pad G	$ 963.00	$ -	$ -	$ -	$ -	$ -	$ 963.00	$ -	$ 963.00	
TOTAL	**$ 36,716.00**	**$ 114.08**	**$ 9,473.32**	**$ 298.60**	**$ 3,415.00**	**$ 114.08**	**$ 49,604.32**	**$ 298.60**	**$ 50,017.00**	

Notas
1. Todos los costos están en millares de USD.
2. Se proporcionan para estos sitios los costos atribuidos para suelos y agua subterránea y no son incluidos en las Tablas 2 y 3.
3. Durante la audiencia de marzo 2019, Ecuador adujo evidencia indicando que Perenco había transferido a y dispuesto de materiales de piscinas de lodo de otros sitios en Payamino 16. Perenco no disputó lo anterior. Considerando que 85% de las piscinas de lodo de Perenco no se ajustaron a los criterios de desempeño de RAOHE, el Tribunal considera más que probable que las piscinas de lodo de este sitio no se hubieran ajustado a RAOHE tomando en cuenta que las prácticas de operaciones de sitio de Perenco no difirieron durante su administración. Los costos de remediación y atribución de responsabilidades estimados por concepto de las piscinas de lodo de Payamino 16 se presentan en la Tabla 4.
4. Ecuador investigó el agua subterránea en el Yuralpa Landfill, pero el Experto Independiente no investigó el agua subterránea en este sitio por razones logísticas. Considerando que al menos un pozo en cada sitio tiene un exceso detectado de TPH y/o bario, el Tribunal considera más que probable que el agua subterránea en Yuralpa LF estaría afectada de manera similar tomando en cuenta que las prácticas de operaciones de sitio de Perenco no difirieron durante su administración. Los costos de remediación y atribución de responsabilidades estimados por concepto del agua subterránea en Yuralpa Landfill se presentan en la Tabla 4.
5. Perenco instaló pozos en Yuralpa B y utilizó piscinas de lodo en el sitio. Debido a una omisión, Ramboll no investigó las piscinas de lodo de Perenco en este sitio. Considerando que el 85% de las piscinas de lodo de Perenco no se ajustaron a los criterios de desempeño de RAOHE el Tribunal considera más que probable que las piscinas de lodo en este sitio tampoco se hubieran ajustado a RAOHE tomando en cuenta que las prácticas de operaciones de sitio de Perenco no difirieron durante su administración. Los costos de remediación y atribución de responsabilidades estimados por concepto de las piscinas de lodo en Yuralpa B se presentan en la Tabla 4.
6. Donde se estima necesario, las aclaraciones sobre la atribución se proporcionan en los comentarios/notas.

Tabla 2. Atribución de Responsabilidades de Remediación - Sitios con Suelo Afectado

Sitio	Atribución de Costos de Remediación del Suelo con base en el Tiempo			Total	Notas/Comentarios
	Fecha de Referencia[2]	Predecesores	Perenco		
Coca 01	Ene-71	$ 644.73	$ 143.27	$ 788.00	
Coca 02, CPF	Dic-88	$ 2,266.68	$ 433.32	$ 2,700.00	El área afectada por bario al este de la piscina de lodo que no pertenece a Perenco se atribuye a los predecesores de Perenco. En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por una de las tres áreas afectadas remanentes.
Coca 04	Ene-90	$ 308.00	$ -	$ 308.00	Las dos áreas afectadas por bario al este de la plataforma son atribuidas a los predecesores de Perenco.
Coca 06	Oct-89	$ 4,319.08	$ 903.92	$ 5,223.00	Las dos áreas afectadas por bario al sureste de la plataforma y ladera arriba del área pantanosa adyacente son atribuidas a los predecesores de Perenco.
Coca 08	Oct-89	$ 10,055.00	$ -	$ 10,055.00	Las áreas afectadas por bario y otros metales al oeste y sur de la plataforma son atribuidas a los predecesores de Perenco.
Coca 09	Ene-93	$ 805.00	$ -	$ 805.00	El área afectada por bario al noroeste de la plataforma es atribuida a los predecesores de Perenco.
Coca 10, 16	Mar-91	$ 482.26	$ 298.74	$ 781.00	En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por el área afectada.
Gacela 01, CPF	Feb-91 - Jun-95	$ 1,572.51	$ 530.49	$ 2,103.00	El área afectada por bario adyacente a la parte suroeste de la plataforma se atribuye a los predecesores de Perenco. La contribución de Perenco al área con excesos de bario al sureste de la plataforma no pudo ser descartada dado que el agua subterránea está afectada por TPH y se detectó TPH en los suelos. En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por las cuatro áreas afectadas remanentes.
Gacela 02	Jun-92	$ 1,336.21	$ 238.79	$ 1,575.00	El área afectada por bario al suroeste de la plataforma es atribuida a los predecesores de Perenco. Véase nota 4.
Gacela 04	Mar-94	$ 195.00	$ -	$ 195.00	El área afectada por bario cerca de la boca del pozo es atribuida a los predecesores de Perenco.
Gacela 05	Sep-94	$ 130.18	$ 116.82	$ 247.00	En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por el área afectada.
Jaguar 01	Ene-88	$ 1,997.01	$ 1,106.99	$ 3,104.00	En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad plena por el impacto de TPH alrededor de la estación de válvulas, que fueron el resultado de un derrame de petróleo que presuntamente ocurrió en 2005-2006, y responsabilidad parcial por el área pantanosa ladera debajo de la estación de válvulas. En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por las tres áreas afectadas.
Jaguar 02	Dic-88	$ 8,308.40	$ 196.60	$ 8,505.00	Las áreas afectadas por bario (y otros metales) al noreste de la plataforma, al oeste de las piscinas de lodo, y a lo largo del arroyo al norte son atribuidos a los predecesores de Perenco. Para las áreas con petróleo crudo superficial resultante del derrame en 2006 (durante la administración de Perenco), Perenco es enteramente responsable. En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por dos de las tres áreas afectadas remanentes.
Jaguar 03	Ene-94	$ 3,604.24	$ 2,038.76	$ 5,643.00	El material de lastre afectado por bario es atribuido a los predecesores de Perenco. No pudo descartarse la contribución de Perenco a las áreas subyacentes con excesos de metales aislados. En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por el área afectada. Véase nota 4
Jaguar 05, CPF	Ene-96	$ 182.48	$ 196.52	$ 379.00	En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por las dos áreas afectadas.
Jaguar 07, 08	Feb-96	$ 323.00	$ -	$ 323.00	El área afectada por bario y níquel es atribuida a los predecesores de Perenco.
Lobo 01	Feb-89	$ 1,361.00	$ -	$ 1,361.00	El área afectada por bario (y otros metales) es atribuida a los predecesores de Perenco.
Lobo 04	Dic-00	$ 717.00	$ -	$ 717.00	El área afectada por bario es atribuida a los predecesores de Perenco. Véase nota 4
Mono CPF	Ene-89 - Feb-96	$ 8,312.80	$ 7,460.20	$ 15,773.00	En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por el impacto de TPH en el área pantanosa, que fue resultado de un derrame de petróleo presuntamente ocurrido en 2008. Esta área también está afectada por bario. La contribución de Perenco a las dos áreas con excesos de metales al norte y este de la CPF no pudo descartarse dado que el agua subterránea está afectada por TPH y se detectó TPH en los suelos. Dado que la instalación de los pozos de producción tuvo lugar de 1989 a 1996, se utilizó una fecha ponderada por la fecha para la atribución de costos de remediación ponderada por el tiempo.
Mono Sur	Sep-96	$ 580.45	$ 700.55	$ 1,281.00	

Tabla 2. Atribución de Responsabilidades de Remediación - Sitios con Suelo Afectado

Sitio	Atribución de Costos de Remediación del Suelo con base en el Tiempo			Total	Notas/Comentarios
	Fecha de Referencia[2]	Predecesores	Perenco		
Oso 01, CPF	Sep-70	$ 186.00	$ -	$ 186.00	El área afectada por bario es atribuida a los predecesores de Perenco.
Payamino 01, CPF	Nov-86 - Dic-91	$ 3,521.12	$ 1,224.88	$ 4,746.00	El área afectada por bario y TPH dentro de la antigua piscina de concreto se atribuye a los predecesores de Perenco dado que este elemento fue cerrado en 1997. El área afectada por TPH aledaña al edificio de potencia de la bomba de petróleo se atribuye a Perenco dado que las muestras de suelo en el área manchada fueron colectadas poco tiempo después de las conclusión de Perenco como empresa operadora. En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por las dos áreas afectadas.
Payamino 02, 08	May-87 - Sep-92	$ 6,126.40	$ 9,189.60	$ 15,316.00	Durante la audiencia de marzo de 2019, Perenco indicó en su presentación de cierre que asumiría el 60% de la responsabilidad por Payamino 2/8.
Payamino 03	Ago-87	$ -	$ 129.00	$ 129.00	El acopio de suelo afectado por TPH en el lado sur de la plataforma se atribuye a Perenco dado que esta acumulación fue primeramente identificado poco tiempo después de la conclusión de Perenco como empresa operadora. En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por el área afectada.
Payamino 04, 14, 20, 24	Jul-88 - May-01	$ 2,404.72	$ 1,006.28	$ 3,411.00	La fecha del presunto derrame al noreste de la plataforma Payamino 4 no pudo ser confirmada. Las dos áreas afectadas por bario en Payamino 14 son atribuidas a los predecesores de Perenco. La fotografía aérea histórica sugiere que el área al suroeste de la plataforma Payamino 4 fue perturbada entre 1989 y 1990 y entre 2003 y 2013, y que el muestreo inicial de esta área fue realizado en 2012; por lo tanto, la atribución basada en el tiempo para esta área considera una duración de 21 años (2013-1990). Puesto que las fechas de instalación de los pozos de producción abarcan de 1988 a 1994, se utilizó una fecha promedio ponderada para la atribución basada en el tiempo de los costos de remediación para todas las otras áreas.
Payamino 10	Mar-93	$ 313.00	$ -	$ 313.00	El área afectada por bario es atribuida a los predecesores de Perenco.
Payamino 13	Oct-93	$ -	$ -	$ -	
Payamino 15	Dic-93	$ -	$ -	$ -	
Payamino 16	Nov-93	$ -	$ -	$ -	
Payamino 21	Oct-94	$ -	$ 155.00	$ 155.00	El área afectada por TPH aledaña al edificio de potencia de la bomba de petróleo se atribuye plenamente a Perenco dado que las muestras de suelo en el área manchada fueron colectadas poco tiempo después de las conclusión de Perenco como empresa operadora. En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por el área afectada.
Payamino 23	May-97	$ 743.93	$ 1,021.07	$ 1,765.00	Para el área afectada aledaña a la piscina de lodo no perteneciente a Perenco hubo un derrumbe de talud. En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por el área afectada.
Punino	Dic-90	$ 75.46	$ 45.54	$ 121.00	En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por el área afectada.
Nemoca	Dic-99	$ 143.54	$ 386.46	$ 530.00	En el Anexo I a los comentarios de Perenco sobre el Informe del Perito Independiente, Perenco asumió responsabilidad parcial por las áreas afectadas.
TOTAL		**$ 61,015.19**	**$ 27,522.81**	**$ 88,538.00**	

Notas

1. Todos los costos están en millares de USD.
2. La atribución basada en el tiempo supone que las descargas al medio ambiente que resultaron en un impacto en los suelos tuvieron lugar al momento de la instalación del primer pozo de producción y continuaron hasta 2009. Para las áreas afectadas que pudieron ser atribuidas a operaciones de la CPF, se supone que la primera descarga tuvo lugar cuando la CPF fue construida.
3. Se consideraron poco probables las contribuciones a las áreas afectadas por el sucesor de Perenco puesto que (a) una revisión de la evidencia de los derrames y descargas de Petroamazonas indica que tales descargas fueron generalmente pequeñas, fueron atendidas con prontitud, y/o tuvieron lugar lejos de las áreas identificadas por el Perito Independiente como para requerir remediación; (b) durante la ejecución de las actividades de investigación de sitios por Ramboll , no se observó evidencia de descargas recientes; y (c) las muestras de suelos colectadas poco después de la conclusión de actividades de Perenco como empresa operadora sirven como una línea de referencia para condiciones ambientales que en gran medida exculparon al sucesor de Perenco.
4. La sección de comentarios/notas indica cuándo son aplicables los principios de atribución o para definir las partes responsables, en particular donde existen múltiples áreas afectadas en un sitio.

Tabla 3. Atribución de Responsabilidades de Remediación - Sitios con Agua Subterránea Afectadas

Sitio	Atribución de Costos de Remediación del Agua Subterránea con base en el Tiempo				Total[2]	Notas/Comentarios
	Fecha de Referencia	Predecesores	Perenco	Sucesores		
Coca 02, CPF	Dic-88	$ 2,436.00	$ 232.65	$ 332.35	$ 3,001.00	Las áreas afectadas del agua subterránea aledañas a la piscina de lodo no perteneciente a Perenco y la piscina de agua de formación anterior a Perenco son atribuidas a los predecesores de Perenco. En el área pantanosa al sureste de la CPF, no se pueden descartar las contribuciones potenciales de Petroamazonas a la contaminación de agua subterránea del uso continuo del separador API.
Gacela 01, CPF	Feb-91 - Jun-95	$ 458.99	$ 452.53	$ 485.48	$ 1,397.00	En el área afectada de agua subterránea aguas abajo del separador en la CPF/ Gacela 1, no se pueden descartar contribuciones potenciales de Petroamazonas a la contaminación del agua subterránea debido al uso continuo del separador API. Para el agua subterránea al sureste de la instalación, las muestras de suelo fueron colectadas poco después de que concluyeran la administración y responsabilidad Perenco y la responsabilidad se ha atribuido a Perenco y a sus predecesores.
Gacela 02	Jun-92	$ 352.61	$ 244.39	$ -	$ 597.00	
Jaguar 1	Ene-88	$ -	$ 438.00	$ -	$ 438.00	Perenco aceptó responsabilidad plena por la descarga asociada con el área de caja de válvulas en 2005/2006 (Anexo I de su carta fechada 22 Feb 2018), la cual es la fuente probable de TPH en la pendiente descendiente del pantano.
Jaguar 2	Dic-88	$ 586.50	$ 586.50	$ -	$ 1,173.00	El área afectada del agua subterránea aledaña a la piscina de lodo es atribuida a los predecesores de Perenco. Por la contaminación del agua subterránea en áreas de crudo superficial resultante de un derrame en 2006 (durante la administración de Perenco), se considera a Perenco plenamente responsable.
Mono CPF	Ene-89 - Feb-96	$ 2,650.95	$ 2,379.05	$ -	$ 5,030.00	
Payamino 01, CPF	Nov-86 - Dic-91	$ 604.25	$ 399.03	$ 400.72	$ 1,404.00	En el área afectada de deterioro del agua subterránea adyacente al arroyo al noroeste de la CPF/Payamino 1, no se pueden descartar contribuciones potenciales de Petroamazonas a la contaminación del agua subterránea debido al uso continuo de la CPF. En lo que respecta al área afectada del agua subterránea en la zona de captación al oeste de la CPF, las muestras de suelo fueron colectadas poco después de la administración de Perenco, y la responsabilidad se ha atribuido a Perenco y sus predecesores.
Payamino 02/08	Mayo-87 - Sep-92	$ 1,737.20	$ 2,605.80	$ -	$ 4,343.00	Durante la audiencia de marzo 2019, Perenco indicó en sus materiales de cierre que asumiría el 60% de la responsabilidad por Payamino 2/8.
Payamino 04	Jul-88 - Mayo-01	$ 1,112.43	$ 498.57	$ -	$ 1,611.00	La fecha del presunto derrame al noreste de la plataforma Payamino 4 no pudo ser confirmada. La fotografía aérea histórica sugiere que el área al suroeste de la plataforma Payamino 4 fue perturbada entre 1989 y 1990 y entre 2003 y 2013 y el muestreo inicial de esta área fue realizado en 2012; por lo tanto, la atribución basada en el tiempo para esta área considera una duración de 21 años (2013-1990). Puesto que las fechas de instalación de los pozos de producción abarcan de 1988 a 1994, se utilizó una fecha promedio ponderada para la atribución basada en el tiempo de los costos de remediación para el área noreste de la plataforma.
Payamino 13	Oct-93	$ 655.88	$ 510.13	$ -	$ 1,166.00	
Payamino 15	Dic-93	$ 655.88	$ 510.13	$ -	$ 1,166.00	
TOTAL		**$ 11,250.68**	**$ 8,856.76**	**$ 1,218.55**	**$ 21,326.00**	

Notas

1. Todos los costos, salvo la nota 2, están en millares de USD
2. Se identificó agua subterránea afectada en Oso 9 y la estimación de remediación ascendió a $3.415.000. Puesto que Perenco instaló pozos de producción y utilizó piscinas de lodo en Oso 9, la atribución de responsabilidad por este sitio se proporciona en la Tabla 1.
3. La atribución basada en el tiempo supone que las descargas al medio ambiente que resultaron en un deterioro del agua subterránea comenzaron al momento de la instalación del primer pozo de producción y continuaron hasta 2009. Para las áreas afectadas que pudieron ser atribuidas a operaciones de la CPF, se supone que la primera descarga tuvo lugar cuando la CPF fue construida.
4. Se consideraron las contribuciones del sucesor de Perenco solo para áreas en donde las descargas podrían ser el resultado del uso continuo de características específicas asociadas con las CPF (v.gr., áreas afectadas aguas abajo de la descarga de un separador API).
5. En los comentarios/notas se proporcionan aclaraciones sobre la atribución cuando las excepciones a los principios de atribución eran aplicables o para definir a las partes responsables, en particular cuando existen múltiples áreas afectadas en un sitio.

Tabla 4. Estimados de remediación y asignación de responsabilidades de remediación -sitios adicionales

Sitios	Medios Afectados	Cantidad	Unidades	Estimación de remediación		Atribución de Costos de Remediación			Notas/Comentarios
				Bajo	Alto	Predecesores	Perenco	Sucesores	
Payamino 16	Piscinas de Lodo	$ 4,300	m3	$ 1,075	$ 1,709	$ 215 - 342	$ 860 - 1367	$ -	Véanse notas 2 y 4.
Yuralpa B	Piscinas de Lodo	$ 30,800	m3	$ 3,004	$ 8,972	$ 451 - 1346	$ 2553 - 7626	$ -	Véanse notas 3 y 4.
Yuralpa LF	Agua Subterránea	$ 11,670	m2	$ 1,166	$ 1,990	$ -	$ 1166 - 1990	$ -	Véanse notas 5 y 6.
	TOTAL			**$ 5,245**	**$ 12,671**	**$ 666 - 1688**	**$ 4,579 – 10,983**	**$ -**	

Notas

1. Todos los costos están en millares de USD.

2. Oryx instaló un pozo y cerró una piscina de lodo en el sitio en 1993. La evidencia es que el material de la piscina de lodo fue desechado en 5 de 6 piscinas de lodo en Payamino 16. Perenco no discutió esto en la audiencia de marzo de 2019. En ausencia de datos que indiquen qué criterios de lixiviabilidad de RAOHE no se cumplen (es decir, piscinas de lodo sin revestimiento o revestidos), se ha estimado una gama de costos de remediación. Los costos estimados han sido asignados al 80% (Perenco) y al 20% (no pertenecientes a Perenco).

3. Durante la audiencia de marzo de 2019, Ecuador señaló que Perenco había instalado pozos en Yuralpa B y que se debería haber realizado un muestreo de las piscinas de lodo; Perenco no lo cuestionó. Perenco instaló seis de los siete pozos en este sitio. El área de la piscina de lodo ha sido estimada a partir de fotografías aéreas disponibles y en ausencia de datos que indiquen qué criterios de lixiviabilidad de RAOHE no se cumplen (es decir, piscinas de lodo sin revestimiento o revestidas), se ha estimado una gama de costos de remediación. La atribución de este costo estimado se ha basado en el número de pozos instalados por Perenco (85%) e comparación con los no pertenecientes a Perenco (15%).

4. Se ha estimado una serie de costos de remediación para las piscinas de lodo. La estimación baja considera que la piscina de lodo no se ajusta a los criterios de desempeño de RAOHE para piscinas sin revestimiento, por lo que el remedio consistiría en la excavación del material de la piscina de lodo, el revestimiento de la piscina de lodo y la colocación del material no tratado en la piscina de lodo revestida. El costo alto estimado considera que el foso de lodo no cumple con los criterios de desempeño de RAOHE para fosos revestidos, por lo que el remedio consistiría en la excavación del material de la piscina de lodo, el tratamiento de los materiales excavados, el revestimiento de la piscina de lodo y la colocación del material tratado en la piscina de lodo revestido.

5. La ubicación del pozo en Yuralpa LF muestreado por IEMS está a más de 40 m del área de disposición de fosos de lodo, donde las pruebas de lixiviación indicaron excesos de bario por encima de los criterios de piscinas de lodo revestidas. La alta predicción razonable de la migración de contaminantes del agua subterránea desde otros sitios indica el potencial del bario para migrar tales distancias.

6. Se desarrolló una serie de costos para la remediación de aguas subterráneas basados en la superficie de las piscinas de lodo que se deben remediar. La estimación baja se basa en la estimación del orden de magnitud, mientras que la estimación alta integra el remedio del agua subterránea (colocación de medios reactivos para el tratamiento del agua subterránea impactada por TPH) con el remedio de las piscinas de lodo. La supuesta agua subterránea afectada en este sitio se atribuye en su totalidad a Perenco, dado que construyó y utilizó las piscinas de lodo.

Tabla 5. Resumen de Atribuciones de Responsabilidades de Remediación

Sitio	Asignación de Costos de Remediación Basada en Tiempo				Total[2]	Notas/Comentarios
	No perteneciente a Perenco	Sólo Perenco	Participación de Perenco	Participación de Predecesores/Sucesores		
Coca 01	$ -	$ -	$ 143.27	$ 644.73	$ 788	
Coca 02, CPF	$ 3,408.80	$ -	$ 665.97	$ 1,626.23	$ 5,701	
Coca 04	$ 308.00	$ -	$ -	$ -	$ 308	
Coca 06	$ 2,679.11	$ -	$ 903.92	$ 1,639.97	$ 5,223	
Coca 08	$ 10,055.00	$ -	$ -	$ -	$ 10,055	
Coca 09	$ 805.00	$ -	$ -	$ -	$ 805	
Coca 10, 16	$ -	$ -	$ 298.74	$ 482.26	$ 781	
Coca 18/19	$ 114.08	$ 3,414.92	$ -	$ -	$ 3,529	Véase nota 2.
Condor N 1	$ -	$ 8,823.00	$ -	$ -	$ 8,823	Véase nota 2.
Gacela 01, CPF	$ 1,034.45	$ -	$ 983.02	$ 1,482.54	$ 3,500	
Gacela 02	$ 991.67	$ -	$ 483.18	$ 697.16	$ 2,172	
Gacela 04	$ 195.00	$ -	$ -	$ -	$ 195	
Gacela 05	$ -	$ -	$ 116.82	$ 130.18	$ 247	
Jaguar 01	$ -	$ 580.92	$ 964.07	$ 1,997.01	$ 3,542	
Jaguar 02	$ 8,894.90	$ 783.10	$ -	$ -	$ 9,678	
Jaguar 03	$ 1,128.60	$ -	$ 2,038.76	$ 2,475.64	$ 5,643	
Jaguar 05, CPF	$ -	$ -	$ 196.52	$ 182.48	$ 379	
Jaguar 07, 08	$ 323.00	$ -	$ -	$ -	$ 323	
Jaguar 9	$ -	$ 541.00	$ -	$ -	$ 541	Véase nota 2.
Lobo 01	$ 1,361.00	$ -	$ -	$ -	$ 1,361	
Lobo 3, 5, 6, 7	$ -	$ 101.00	$ -	$ -	$ 101	Véase nota 2.
Lobo 04	$ 717.00	$ -	$ -	$ -	$ 717	.
Mono CPF	$ -	$ -	$ 9,839.26	$ 10,963.74	$ 20,803	
Mono Sur	$ -	$ -	$ 700.55	$ 580.45	$ 1,281	
Oso 01, CPF	$ 186.00	$ -	$ -	$ -	$ 186	
Oso 3-8, 13, 14	$ -	$ 1,906.00	$ -	$ -	$ 1,906	Véase nota 2.
Oso 9, 12, 15-20	$ -	$ 8,732.00	$ -	$ -	$ 8,732	Véase nota 2.
Oso 9A	$ -	$ 2,948.00	$ -	$ -	$ 2,948	Véase nota 2.
Oso 9B	$ -	$ 1,507.00	$ -	$ -	$ 1,507	Véase nota 2.
Oso A, 21, 23	$ -	$ 228.00	$ -	$ -	$ 228	Véase nota 2.
Payamino 01, CPF	$ 1,690.69	$ 16.10	$ 1.607.81	$ 2.835.40	$ 6,150	
Payamino 02, 08	$ -	$ -	$ 11,795.40	$ 7,863.60	$ 19,659	
Payamino 03	$ -	$ 129.00	$ -	$ -	$ 129	
Payamino 04, 14, 20, 24	$ 220.20	$ -	$ 1,504.84	$ 3,296.96	$ 5,022	

Sitio	Asignación de Costos de Remediación Basada en Tiempo				Total[2]	Notas/Comentarios
	No perteneciente a Perenco	Sólo Perenco	Participación de Perenco	Participación de Predecesores/Sucesores		
Payamino 10	$ 313.00	$ -	$ -	$ -	$ 313	
Payamino 13	$ -	$ -	$ 510.13	$ 655.88	$ 1,166	
Payamino 15	$ -	$ -	$ 510.13	$ 655.88	$ 1,166	
Payamino 16	$ -	$ -	$ -	$ -	$ -	Véase nota 2.
Payamino 21	$ -	$ 155.00	$ -	$ -	$ 155	
Payamino 23	$ -	$ -	$ 1,021.07	$ 743.93	$ 1,765	
Payamino WTS	$ -	$ 2,978.00	$ 1,194.40	$ 298.60	$ 4,471	Véase nota 2.
Punino	$ -	$ -	$ 45.54	$ 75.46	$ 121	
Nemoca	$ -	$ -	$ 386.46	$ 143.54	$ 530	
Yuralpa - Chonta	$ -	$ 2,049.00	$ -	$ -	$ 2,049	Véase nota 2.
Yuralpa - LF	$ -	$ 12,217.00	$ -	$ -	$ 12,217	Véase nota 2.
Yuralpa Pad A	$ -	$ 1,236.00	$ -	$ -	$ 1,236	Véase nota 2.
Yuralpa Pad B	$ -	$ -	$ -	$ -	$ -	Véase nota 2.
Yuralpa Pad D	$ -	$ 475.00	$ -	$ -	$ 475	Véase nota 2.
Yuralpa Pad E	$ -	$ 193.00	$ -	$ -	$ 193	Véase nota 2.
Yuralpa Pad F, CPF	$ -	$ 98.00	$ -	$ -	$ 98	Véase nota 2.
Yuralpa Pad G	$ -	$ 963.00	$ -	$ -	$ 963	Véase nota 2.
TOTAL	**$ 34,425.50**	**$ 50,074.04**	**$ 35,909.85**	**$ 39,471.62**	**$ 159,881**	

Notas

1. Todos los costos están en millares de USD.
2. Los costos de remediación y atribución de responsabilidades por Agua Subterránea de Yuralpa Landfill y piscinas de lodo de Payamino 16 y Yuralpa B no se incluyen en esta tabla y se proporcionan en la Tabla 4.

ANEXO B

LISTA DE TESTIGOS Y PERITOS PARA LA RECONVENCIÓN SOBRE INFRAESTRUCTURA

Burlington c. Ecuador	***Perenco c. Ecuador***
Testigos de Ecuador para la reconvención sobre infraestructura ▪ Sr. Pablo Alberto Luna Hermosa[1205] *Petroamazonas* ▪ Sr. Manuel Solís[1206] *Petroamazonas* ▪ Sr. Marco Puente[1207] *Petroamazonas* ▪ Sr. Diego Montenegro[1208] *Petroamazonas* *Testigos y peritos de Burlington para la reconvención sobre infraestructura* ▪ Sr. Wilfrido Saltos[1209] *Perenco Ecuador Limited*	*Testigos de Ecuador para la reconvención sobre infraestructura* ▪ Sr. Pablo Alberto Luna Hermosa[1213] *Petroamazonas* ▪ Sr. Manuel Solís[1214] *Petroamazonas* ▪ Sr. Marco Puente[1215] *Petroamazonas* ▪ Sr. Diego Montenegro[1216] *Petroamazonas* *Testigos y peritos de Perenco para la reconvención sobre infraestructura* ▪ Sr. Wilfrido Saltos[1217] *Perenco Ecuador Limited*

1205 Véase párr. 893 de la Decisión sobre Reconvenciones de *Burlington*: El perito de Burlington, Intertek, y el testigo de Ecuador, Sr. Pablo Luna, explican en forma detallada los contenidos de estos estándares con respecto a la construcción, mantenimiento y reemplazo de infraestructura aguas arriba en la industria hidrocarburífera.

1206 Véase párr. 894 de la Decisión sobre Reconvenciones de *Burlington*: Ecuador alega que el Consorcio violó su obligación de invertir en infraestructura y mantenerla y entregarla en buen estado de conservación, de conformidad con los estándares de la industria, al seguir una estrategia de mantenimiento consistente en "mantenerse en funcionamiento hasta fallar" ("run to failure"). Según el Sr. Manuel Solís, la política de mantenimiento de Perenco estaba impulsada por una "obsesión [...] por reducir costos e invertir lo mínimo indispensable", lo que se "traducía en una falta de seguridad operativa".

1207 Véase Decisión sobre Reconvenciones de *Burlington*, nota al pie 1895: "*Réplica, ¶ 486, en alusión a: Puente DT1, ¶ 19*".

1208 Véase Decisión sobre Reconvenciones de *Burlington*, párr. 937 & nota al pie 1943: "*R-EPA, ¶ 993, que invoca las declaraciones testimoniales de los Sres. Montenegro y Luna, en particular: Montenegro DT3, ¶ 19...*".

1209 Véase Decisión sobre Reconvenciones de *Burlington*, párr.

1213 Véase Memorial de Contestación sobre Responsabilidad y Reconvenciones de Ecuador, párr.. 915.

1214 *Id.*

1215 Véase, por ejemplo, Réplica de Ecuador sobre Reconvenciones, párr.. 492, en alusión al testimonio del Sr. Marco Puente.

1216 Véase Memorial de Contestación sobre Responsabilidad y Reconvenciones de Ecuador, párr.. 915.

1217 Véase Escritos Posteriores a la Audiencia de Perenco sobre Reconvenciones, párr.. 112.

▪ Sr. Eric d'Argentré[1210] *Perenco Ecuador Limited* ▪ Dr. Geoffrey R. Egan[1211] *Intertek* ▪ Sr. Alex Martinez[1212] *Burlington Resources Peru Ltd*	▪ Sr. Eric d'Argentré[1218] *Perenco Ecuador Limited* ▪ Dr. Geoffrey R. Egan[1219] *Intertek* ▪ Sr. Alex Martínez[1220] *Burlington Resources Peru Ltd*

1210 Véase Decisión sobre Reconvenciones de *Burlington*, párr.. 913 & nota al pie 1908; párr. 916: "*Todas estas pruebas fueron corroboradas asimismo durante la Audiencia, durante la cual el Sr. D'Argentré explicó la manera en que los equipos utilizados en ambos Bloques se encontraban sujetos a la 'supervisión intensa' del Gobierno durante todo el plazo de a lo largo de toda la duración de las operaciones del Consorcio*".

1211 *Ibid.*, párr. 902 - Ecuador trata de desestimar la relevancia y confiabilidad del testimonio del Dr. Egan.

1212 Véase Decisión sobre Reconvenciones de *Burlington*, párr. 12

1218 Véase Memorial de Contestación sobre Reconvenciones de Perenco, párr.. 532.

1219 Véase Memorial de Contestación sobre Reconvenciones de Perenco, párr.. 518.

1220 Véase Escrito Posterior a la Audiencia de Perenco sobre Reconvenciones , párr.. 112.