



A Rejoinder to Criticisms of the Expert Opinion of Kenneth J. Goldstein, M.A., CGWP and Jeffrey W. Short, Ph.D.
Regarding the Environmental Contamination From Texpet's E&P Activities in the Former Napo Concession Area
Oriente Region, Ecuador

In the Matter of An Arbitration Under the Rules of the United Nations Commission on International Trade Law

Chevron Corporation and Texaco Petroleum Company vs. the Republic of Ecuador

PCA Case No. 2009-23

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Executive Summary and Summary of Expert Opinions

The Louis Berger Group, Inc. ("LBG"), an international engineering firm with expertise in environmental evaluations and remediation, was initially retained in 2011 by Winston & Strawn LLP (Winston) on behalf of Respondent, the Republic of Ecuador (Republic), to provide environmental technical consulting relative to *the Matter of An Arbitration Under the Rules of the United Nations on International Trade Law; Chevron Corporation and Texaco Petroleum Company v. The Republic of Ecuador*, an arbitration (Arbitration) arising from the environmental condition of the Former Napo Concession Area ("Concession Area"), Oriente Region, Ecuador ("Oriente").¹ Specifically, we were retained (i) to review the contents of the court record in the *Aguinda et al. v. Chevron* lawsuit (Lago Agrio Lawsuit, or Lawsuit), including the February 2011 Judgment, to assist Winston. In addition, we were asked (ii) to review various documents and data not in the court record which had been prepared and produced by the technical consultants for and the applicable subsidiary of Texaco, Inc. (Texaco), Texaco Petroleum Company (Texpet) (collectively, Claimants), in the course of their defense of the Lawsuit. Subsequently, we were further retained (iii) to independently evaluate evidence of past and persistent environmental contamination in the former Concession Area due to Texpet's exploration and production (E&P) operations in the Concession Area from 1964 and 1990 and (iv) to assess, qualitatively, the reasonableness of the damage elements adjudicated in Judge Zambrano's judgment (Judgment) against Chevron.²

In February 2013, we presented the findings of our initial evaluation of then-available information in a report entitled *Expert Opinion of Kenneth J. Goldstein, M.A., CGWP and Jeffrey W. Short, Ph.D. Regarding the Environmental Contamination From Texpet's E&P Activities in the Former Napo Concession Area Oriente Region, Ecuador* (hereinafter referred to as the *LBG February 2013 Expert Report*). In June 2013, Claimants submitted their *Reply Memorial Track 2*, including *Annex A*, and numerous expert rebuttal reports. The opinions presented in this rejoinder report (Rejoinder) are focused primarily (although not exclusively) on the rebuttal reports of Claimants' environmental expert witnesses (John A. Connor,³ Robert E. Hinchee,⁴ and to a lesser extent Gregory S. Douglas⁵), as well as on the environmental section of *Claimants' Reply Memorial Track 2, Annex A*.⁶ Those documents contain criticisms of our *LBG February 2013 Expert Report* and the Republic's other February 2013 submissions which are flawed by misstatements and inaccuracies. We,

¹ We reserve the right to amend the findings and opinions in this Report should additional information be presented or reviewed.

² We understand that on February 14, 2011, Presiding Judge: AB Nicolas Zambrano, PROVINCIAL COURT OF SUCUMBIOS. – ONLY COURT ROOM OF THE PROVINCIAL COURT OF JUSTICE OF SUCUMBIOS ruling set forth that Chevron could be held accountable for Texpet's liabilities. AGUINDA ET AL. V. CHEVRON CORPORATION, No. 2003-002, dated February 14, 2011 at 16 - 22] (hereinafter referred to as the Lago Agrio Lawsuit).

³ *Expert Opinion of John A. Connor, P.E., P.G., B.C.E.E. Regarding Remediation Activities and Environmental Conditions in the Former Petroecuador – Texaco Concession, Oriente Region, Ecuador, Response to LBG Report of February 2013, June 3, 2013* (hereinafter referred to as Connor, 2013).

⁴ *Expert Report of Robert E. Hinchee, Ph.D., P.E., May 31, 2013* (hereinafter referred to as Hinchee, 2013)

⁵ *Rebuttal Expert Report of Gregory S. Douglas, Ph.D., June 1, 2013* (hereinafter referred to as Douglas, 2013)

⁶ *Claimants' Reply Memorial Track 2, Annex A, June 5, 2013*

Kenneth J. Goldstein, CGWP⁷ and Edward A. Garvey, PhD., P.G.,⁸ on behalf of LBG and the Republic and in conjunction with our colleagues, prepared this Rejoinder to, among other things, respond to certain disagreements and criticisms asserted by Claimants and their expert witnesses regarding our *LBG February 2013 Expert Report*.

The opinions⁹ presented in this Rejoinder are based upon our own experience and education¹⁰ and the experience and education of our professional colleagues at LBG¹¹ (collectively, the LBG team), as well as other experts retained on behalf of the Republic.¹² We have relied on the following information and data sources: (i) those relied upon to prepare the *LBG February 2013 Expert Report*; (ii) additional information and data obtained during the course of the §1782 discovery process subsequent to submission of the *LBG February 2013 Expert Report*;¹³ and (iii) that resulting from site investigations that we conducted in the Concession Area between July and October 2013 at five former Texpet-operated well sites in Ecuador,¹⁴ as well as (iv) technical research that we conducted to respond to criticisms embodied in *Claimants' Reply Memorial Track 2* and their accompanying expert reports.¹⁵ Based upon our experience and education (i.e., Mr. Goldstein and Dr. Garvey), and the LBG team's subsequent data evaluation, we reaffirm¹⁶ the accuracy and reliability of the opinions presented in our *LBG February 2013 Expert Report*. The opinions we detail in the body of this Rejoinder Report may be summarized as follows:

- 1) Texpet created hundreds of uncontrolled contaminant sources (e.g., waste pits, well sites, and production stations) distributed across the Concession Area, causing widespread contamination.¹⁷

⁷ Mr. Goldstein is providing opinions regarding the nature and extent of contamination in the former Concession Area resulting from Texpet's E&P activities in the former Concession Area, including the results of independent site inspections and investigations in which he personally participated.

⁸ Dr. Edward A. Garvey, PhD, PG, an LBG employee, is providing opinions and analyses regarding analytical methods and geostatistics contained in this report that were developed to respond to erroneous assertions made by Claimants' experts.

⁹ As requested by counsel, we did not provide opinions related to the quantification of monetary damages resulting from Chevron's operations in the Oriente nor does this report offer an opinion as to the assessment of contribution for contamination from Petroecuador after 1990.

¹⁰ A summary of Mr. Goldstein's qualifications is presented in Annex 3 of the *LBG February 2013 Expert Report* and Curricula Vitae for both Mr. Goldstein and Dr. Garvey are presented in Appendix F of this Rejoinder Report.

¹¹ This includes professional engineers (PEs) and scientists who hold MS and PhD level degrees.

¹² Mr. Ken Kaigler and Dr. Paul Templet (retained directly by Winston); Dr. Jeffrey Short and Dr. Harlee Strauss (retained by LBG on behalf of Winston and the Republic), and Dr. Ed Theriot, an employee of LBG. Descriptions of their respective qualifications are provided in their respective Reports. Dr. Philippe Grandjean (retained by Winston and the Republic) also provided an opinion for the Rejoinder, but his opinion was not referenced or considered here.

¹³ Section 1782 of Title 28 of the United States Code (28 U.S.C. § 1782) is the mechanism by which the United States provides assistance to foreign or international tribunals in obtaining evidence.

¹⁴ See Appendix B - Site Investigation and Data Summary Report, Napo Concession Area, Oriente Region, Ecuador. In the Matter of BIT Arbitration, Chevron v. Government of Ecuador (hereinafter referred to as Appendix B)

¹⁵ *Claimants' Reply Memorial*, including Annex A and Expert Reports by John A. Connor, Robert E. Hinchee, and Gregory S. Douglas, 2013

¹⁶ With minor clarifications as is presented in Appendix A of this Report

¹⁷ We clarify that we used the term "widespread contamination" to connote: a pattern of contamination at multiple E&P facilities across the Concession Area, present in one or more environmental media beyond the immediate confines of the E&P facilities.

- 2) Such contamination was a direct and predictable consequence of the endemic substandard operational practices Texpet employed during its E&P operations and activities from 1964 to 1990, which failed to comply with applicable Ecuadorian law, the 1973 Concession Agreement, and generally accepted international E&P practices in similar tropical rainforest environments.¹⁸
- 3) Such contamination, which was confirmed by Chevron's own sampling and analysis program during the Lago Agrio trial, persists today outside of the well field facilities.¹⁹ Contamination is present in portions of the Concession Area where both ecological and human receptors have been exposed in the past, and will likely continue to be exposed in the future. These contaminants include chemicals that are known to be toxic and carcinogenic.²⁰
- 4) The results of the LBG team's recent (July to October, 2013) site investigations stand in marked contrast to Claimants' experts' opinions. At each of the five Texpet-drilled-and-operated well sites investigated, we found oil-contaminated pits and oil-based contamination of surface water and sediments²¹ attributable to Texpet's operations. We also found that contamination from these sources has persisted in the environment since at least 1990 and probably earlier, and is currently found at locations where ecological systems are impacted and the human and animal inhabitants are exposed.
- 5) Chevron's sampling and analytical testing program employed during the Judicial Inspections (JIs) in the Lawsuit was inadequate to either establish or negate the extent of adverse impacts to the environment from Texpet's E&P operations. In addition, the Lago Agrio court (Court) did not have Chevron's Pre-Inspection (PI) data, which when reviewed with their JI data presents a more complete understanding of the extent of E&P contamination in the Oriente. Our in-depth analysis of Chevron's JI and PI data shows that Claimants' assertion that they defined "clean perimeters" for all of the pits investigated in the JIs²² is inherently false. The majority of the sites investigated by Chevron for the JIs have insufficient data (even aggregating the filed JIs and the unfiled PIs) to show that contaminants remain immobile (i.e., that they have not migrated away from their source location through soil or groundwater). Moreover, for the following reasons these data do not support Claimants' assertion that they had delineated clean perimeters:
 - a. Many of Chevron's reputedly "clean" perimeter samples were not collected on the well field facility, but rather on neighboring properties.²³
 - b. Chevron's own data show that it is as likely for a sample of sediment collected downstream from its E&P facilities to be contaminated as it is for soil samples collected from un-remediated pits on those facilities.²⁴

¹⁸ Texpet's practices were substandard to other contemporaneous operations in similar environmental settings. *See generally Expert Opinion of Ken Kaigler, P.E. Comparing Texpet E&P Practices in Ecuador to Contemporaneous Practices in the U.S. and Venezuela* (hereinafter referred to as Kaigler, 2013). *See LBG February 2013 Report*, Section 2.2 and supplemented by this Rejoinder; *see generally Expert Report of Paul H. Templet, PhD*, 2013 (hereinafter referred to as Templet, 2013)

¹⁹ *See generally* Appendix B

²⁰ *See generally* Strauss, 2013

²¹ *See generally* Appendix B

²² Connor, 2013, p. 2-3

²³ *See generally* Appendix C

²⁴ *See generally* Appendix C

- c. Our analysis of Chevron's own data collected in conjunction with the Lago Agrio Lawsuit shows that, as of the time the PIs and JIs were conducted, surrounding Texpet-constructed and operated well sites and production stations: (i) approximately 2.1 square kilometers of surface soil outside of the associated pits likely remained contaminated at concentrations above 1000 mg/kg of Diesel Range Organics (DRO) plus Gasoline Range Organics (GRO)²⁵ (collectively, DRO/GRO) and (ii) (for purposes of comparison) 10.2 square kilometers of surface soil likely remained above the 100 mg/kg TPH threshold used in the Lago Agrio Lawsuit.

Based on these results, we recommend further investigation to fully characterize and subsequently remediate sites where appropriate Ecuadorian standards are exceeded in soil, sediment, and water.

- 6) Contamination in the Oriente caused and continues to cause unacceptable risk to human health and the environment. Claimants' expert Thomas McHugh's quantitative risk assessments²⁶ "have five fatal flaws that lead him to the incorrect conclusion that petroleum contamination in the Concession Area does not result in health risks."²⁷ Quantitative human health risk assessments, prepared by Dr. Harlee Strauss,²⁸ indicate that significant residual human health risks attributable to Texpet's activities remain to this day.
- 7) The Judgment's assessment of damages appears at least reasonable.

As is stated above, our recent investigation of five Texpet well sites demonstrates persistence and migration of contamination from those well sites counter to assertions by Claimants. In summary, we also opine:

- 1) Claimants' unsupported assertion that any groundwater investigation beyond sampling of nearby, hand dug water wells is unwarranted,²⁹ is not borne out by field data showing that, where groundwater was found to exist as a resource, it had been contaminated.³⁰
- 2) Chevron's (and Texpet's) blanket assumption that an impermeable clay deposit occurs everywhere, rendering pit lining unnecessary,³¹ is false.
- 3) Our 2013 sampling shows that sediment contamination in streams that flow adjacent to E&P facilities occurs at significant distances from the facility and at locations where people and animals access the streams.³²
- 4) Our 2013 sampling demonstrates that contamination caused by Texpet's operations is still present and mobile in the environment.³³ Our well site inspections and follow-up investigations documented instances where natural

²⁵ DRO and GRO are a fraction of the parameter Total Petroleum Hydrocarbon (TPH), which has an Ecuadorian standard of 1000 mg/kg RAOHE for Sensitive Ecosystems. See Short, 2013, Section 4.1.4 and Sections 3.3.4 of this Rejoinder.

²⁶ See generally *Expert Opinion of Thomas E. McHugh, PHD, D.A.B.T. Regarding Lack of Evidence of Health Risks Associated with Petroleum Operations in the Former Petroecuador-Texaco Concession Area, Oriente Region, Ecuador (2013) Rebuttal to Mr. Caberra's Excess Cancer Death And Other Health Effects Claims, and His Proposal for a New Health Infrastructure*, Micheal A Kalsh, Ph.D., MPH, Thomas McHugh, Ph.D., D.A.B.T., and Theodore D. Thomasi, Ph.D., 2008, and Connor, 2010

²⁷ Strauss, 2013, p. 11

²⁸ See generally Strauss, 2013

²⁹ Connor, 2013, p. 14-15, p. 29

³⁰ See generally Appendix B and Section 2.2 of this Report

³¹ Connor, 2013, p. 3

³² See generally Appendix B and Section 2.2 of this Report

³³ Short, 2013, p.14-16; See generally Appendix B and Section 2.2 of this Report

resources (i.e., soils, sediments, surface water, and groundwater) continue to be impacted by Texpet-era E&P activities. Along the streams adjacent to the sites, we observed crude oil bubbling upward when sediment was disturbed. We also observed areas where people use these same impacted water resources.³⁴

- 5) This Texpet-originated contamination is not limited to open pits or as part of unremediated oil spills, is not confined to localized areas within the oil facility, and includes chemical impacts to groundwater and surface water.³⁵

From an environmental and human health perspective, the data and information available to the Tribunal, including the results of our independent investigations and other technical research performed to address Claimants' criticisms, reveal the true nature of Texpet's legacy in the Oriente. The assertions by Claimants³⁶ that the impact of Texpet's E&P activities was mainly aesthetic,³⁷ that residual crude oil remaining from those activities is all weathered, immobile, and limited to the immediate area of the oilfield facilities,³⁸ and that remediation was only important for ill-defined "practical concerns,"³⁹ are wrong. The environment of the former Concession Area has been damaged by Texpet's E&P activities, and this damage and its impacts to the residents continue to this day; thus, the Judgment's assessment of damages in the Lago Agrio trial appears at least reasonable.

³⁴ See generally Appendix B and Section 2.2 of this Report

³⁵ See generally Appendix B and Section 2.2 of this Report

³⁶ Including Texpet and Chevron as individual entities.

³⁷ Henderson, et al., 1990, p. 1

³⁸ Connor, 2013, p. 2-3

³⁹ Connor, 2013, p. 2