IN THE MATTER OF AN ARBITRATION UNDER CHAPTER ELEVEN OF THE NORTH AMERICAN FREE TRADE AGREEMENT AND THE UNCITRAL ARBITRATION RULES, 1976

-BETWEEN-

THEODORE DAVID EINARSSON, HAROLD PAUL EINARSSON, RUSSELL JOHN EINARSSON, GEOPHYSICAL SERVICE INCORPORATED

(the "Claimants")

-AND-

GOVERNMENT OF CANADA

(the "Respondent")

(ICSID Case No. UNCT/20/6)

EXPERT REPORT OF PAUL SHARP
of PricewaterhouseCoopers LLP

CER-06

STIKEMAN ELLIOTT LLP
Barristers & Solicitors
4200 Bankers Hall West
888 - 3rd Street S.W.
Calgary, AB T2P 5C5 Canada
P: (403) 266 9064
E: mlemmens@stikeman.com
vlanctotfortier@stikeman.com
mbastilleparent@stikeman.com

Matti Lemmens
Vincent Lanctôt-Fortier
Marianne Bastille-Parent
Counsel for Harold Paul Einarsson, in his own capacity and as personal representative of the Estate of Theodore David Einarsson, Russell John Einarsson and Geophysical Service Incorporated

Expert Report of Paul Sharp of PricewaterhouseCoopers LLP

CER-06

1. Please see the attached Appendix "A" of which includes my report in its entirety.

2. I make this witness statement and expert report in support of the Claimants' claim in this proceeding and for no other purposes.

3. I swear this expert report in English.

Signed at Calgary, Alberta on May 30, 2024

PAUL SHARP
PricewaterhouseCoopers LLP
111-5th Avenue SW
Suite 3100
Calgary, AB T2P 5L3

Appendix "A"

PUBLIC VERSION

Einarsson et al. v. Canada

ICSID CASE NO. UNCT/20/6

Reply Report in Response to the January 16, 2023 Report Prepared by The Brattle Group and the January 14, 2023 Report Prepared by Mr. Robert Hobbs

PRIVILEGED AND CONFIDENTIAL

May 30, 2024

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Privileged and Confidential
May 30, 2024

Ms. Matti Lemmens
Stikeman Elliott LLP
4200 Bankers Hall West
888 – 3rd Street S.W.
Calgary AB T2P 5C5
Canada

Dear Ms. Lemmens:

Re: Reply Report in Response to the January 16, 2023 Expert Report Prepared by The Brattle Group, Inc. (the "Brattle Report") and the January 14, 2023 Expert Report Prepared by Mr. Robert Hobbs (the "Hobbs Report")

Introduction

1. PricewaterhouseCoopers LLP ("PwC", "us" or "we") has been requested by Stikeman Elliott LLP ("Stikeman Elliott", "you" or "Counsel") to provide a reply report (the "PwC Reply Report") in response to the Brattle Report and the Hobbs Report.

2. The Brattle and Hobbs Reports included commentary on our September 26, 2022 expert report (the "Initial PwC Report") which included:

   a. An estimate-level valuation report that quantified the fair market value of Geophysical Service Inc. ("GSI") as at November 30, 2017 and June 30, 2022 (the "Valuation Dates") assuming a scenario wherein certain alleged actions on the part of the Government of Canada that rendered the intellectual property rights of GSI in its seismic works unenforceable in or through certain Canadian court decisions[1] did not occur ("But-for Scenario"); and

   b. Certain other quantifications of loss as requested by you including a quantification of loss of employment earnings, a quantification of loss of certain amounts lent to GSI, and a quantification of interest accrued on the aforementioned losses up to June 30, 2022.

[1] Hereinafter referred to as the "Decisions". Specifically, 2016 AB QB 230, 2017 ABCA 125, and 2017 SCC 37634.

PricewaterhouseCoopers LLP
111-5th Avenue SW, Suite 3100, Calgary, Alberta, Canada T2P 5L3
T: +1 403 509 7500, F: +1 403 781 1825 www.pwc.com/ca

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Stikeman Elliott LLP
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3. The Initial PwC Report was provided to you in connection with an arbitration, initiated by Mr. Theodore David Einarsson, Mr. Harold Paul Einarsson, and Mr. Russell John Einarsson (together, the "Claimants"), against the Government of Canada (the "Respondent") pursuant to Article 3 of the Arbitration Rules of the United Nations Commission on International Trade Law and certain articles in Chapter 11 of the North American Free Trade Agreement ("NAFTA"). We understand that you represent the Claimants in this matter.

4. The conclusions of the Initial PwC Report with respect to lost equity value are summarized in the following table:

Lost Equity Value
(In $CAD 000's)

	Low	High
November 30, 2017		
Lost equity value	343,798	429,564
Accrued interest on lost equity value	36,280	77,345
Total	380,078	506,909
June 30, 2022		
Lost equity value	252,236	319,742

5. The conclusions of the Initial PwC Report with respect to losses on loans are summarized in the following tables:

Loss on Loan from Shareholder of Affiliate
(In $CAD 000's)

	Low	High
Loss on loan at November 30, 2017	1,382	1,382
Accrued interest up to June 30, 2022	130	276
Total loss at June 30, 2022	1,511	1,658

Loss of Shareholder's Loan - Mr. Davey Einarsson
(In $CAD 000's)

	Low	High
Loss on loan at November 30, 2017	2,391	2,391
Accrued interest up to June 30, 2022	224	478
Total loss at June 30, 2022	2,616	2,870

Loss of Shareholder's Loan - Mr. Paul Einarsson
(In $CAD 000's)

	Low	High
Loss on loan at November 30, 2017	1,478	1,478
Accrued interest up to June 30, 2022	139	296
Total loss at June 30, 2022	1,616	1,773

6. Finally, the conclusions of the Initial PwC Report with respect to the losses of employment earnings are summarized in the following tables:

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Loss of Employment Earnings - Mr. Russell Einarsson
(In $CAD 000's)

	Low	High
April 18, 2016		
Loss of earnings	4,462	6,141
Accrued interest on loss	101	215
Total	4,564	6,356

Loss of Employment Earnings - Mr. Davey Einarsson
(In $CAD 000's)

	Low	High
April 18, 2016		
Loss of earnings	1,020	1,058
Accrued interest on loss	111	236
Total	1,130	1,294

Loss of Employment Earnings - Mr. Paul Einarsson
(In $CAD 000's)

	Low	High
April 18, 2016		
Loss of earnings	7,536	10,175
Accrued interest on loss	179	380
Total	7,715	10,555

7. The Brattle Report and the Hobbs Report contain claims and critiques regarding the content and the conclusions reached in the Initial PwC Report. What follows herein is a response to those claims and critiques.

8. The individuals that prepared this report did so to the best of their knowledge, acting independently and objectively.

9. PwC's compensation is not contingent on an action or event resulting from the use of the PwC Reply Report.

10. This report has been prepared in conformity with the Practice Standards of the Canadian Institute of Chartered Business Valuators ("CICBV").

11. Financial terms discussed herein are defined in a manner consistent with the Initial PwC Report.

12. A discussion of relevant background information, our analysis, and the methodology is set out in the balance of this PwC Reply Report. All references to currency in this PwC Reply Report are to Canadian dollars ("$"), unless otherwise stated.

Restrictions and Qualifications

13. This report has been prepared for Counsel and is subject to the Restrictions and Qualifications as set out at Appendix A.

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Scope of Review

14. In preparing this PwC Reply Report, we reviewed and relied upon the documentation and other information as set out at Appendix B. We have assumed the accuracy and completeness of this information and have not independently audited, verified or confirmed such accuracy or completeness. Our analysis and comments are based on the information provided to us. Should further information be provided, we reserve the right to amend the analysis and/or comments set out in this PwC Reply Report.

Assumptions

15. In preparing the PwC Reply Report, we made assumptions as set out at Appendix C in addition to those described throughout this report. Amendment of any of these assumptions could materially impact our report.

Background

16. For the purposes of this report and our analysis, we have considered the following background information.

GSI

17. Please refer to the Initial PwC Report for a description of GSI.

Our Understanding of the Current Situation

18. We understand that GSI was required to submit certain versions of non-exclusive data regarding the Canadian offshore areas to Canadian governmental agencies. Additionally, third parties in possession of various versions of GSI's seismic data also submitted that data to Canadian governmental agencies. We understand that this data was then disclosed to and copied by third parties (the "Disclosures"). GSI was then unable to enforce its intellectual property rights against those third parties as a result of the Decisions that became final on November 30, 2017.

19. Because the majority of GSI's business was from the licensing of non-exclusive data to third parties, we understand that its inability to enforce its intellectual property rights relating to its seismic data has materially reduced the demand of GSI to license its existing database of seismic data. With this revenue stream in an impaired state, GSI was forced to limit its shooting of new data, limit new investment, and reduce its staff count.

20. As well, as a result of the Decisions, GSI's client relationships were negatively impacted when it lost the litigation.

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21. We understand that it is the position of the Claimants that as a result of the Decisions, GSI's investors had their investment expropriated by the Government of Canada[2]. Specifically, the Decisions confiscated the Claimants' copyright in the seismic works in contravention of NAFTA. The Decisions are the conclusion of enforcement claims commenced by GSI for the alleged actions of the Government of Canada to take GSI's copyrights which resulted in the confiscation of the copyright work. In short, it is our understanding that the Decisions are the alleged breaches.

22. Importantly, we understand that the litigation leading to the Decisions, which occurred between 2007 and 2017 (the "Litigation Period"), has had an ancillary impact on GSI prior to the conclusion of that litigation which has resulted in losses of revenues.

PwC's Summary Comments in Response to the Brattle Report

The Initial PwC Report's Damages Calculation

23. The Brattle Report argues that instead of determining the fair market value of GSI in the But-for Scenario as was done in the Initial PwC Report, a more appropriate quantification of damages would be a liquidation approach. This approach would require the valuation of GSI's two most valuable assets as at the Valuation Dates: its seismic data and remaining outstanding litigation claims.

24. First, the approach suggested in the Brattle Report requires the valuation of litigation claims, which is highly speculative. It would also require the valuation of GSI's seismic database on an as-is basis, the value of which is significantly depleted because of the alleged breaches. Ultimately, the approach suggested in the Brattle Report would fail to value GSI but for the alleged breaches and would instead determine the actual value of the company at the Valuation Dates, which is likely to be nil.

[2] Claimants Memorial, pgh. 365

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25. It is our understanding that although the Decisions resulted in the expropriation of GSI's business in 2017, the expropriation had ancillary effects. The period of ancillary effects includes the Litigation Period. Had GSI the ability to defend its copyrights, it would be in a materially different position at the Valuation Dates. As explained in this PwC Reply Report, the purpose of the But-for valuation is to determine the full extent of the financial impact that the Decisions ultimately had on GSI's business and these impacts precede the Decisions themselves. In a But-for Scenario in which the Decisions are the expropriation, it is necessary to factor in the detrimental ancillary effects of the Decisions which are intrinsically linked to the Decisions. A liquidation value of GSI immediately preceding the Supreme Court of Canada's November 30, 2017 decision completely misses this objective and would understate damages. We note that the Brattle Report has not offered a conclusion with respect to the quantification of damages under either a liquidation approach or an approach that reflects the ancillary effects of the Decisions.

The Initial PwC Report's Valuation Approach

26. The Brattle Report characterizes our But-for valuation, which uses the commonly-used capitalized cash flow method as the primary approach, as a "damages machine that avoids any time limitation on damages"[3].

27. Our valuation does not attempt to claim past losses as damages. The intention behind our normalization of historical revenues between 2000 and 2012 (the "Normalization Period") is to understand the level of revenues that would have been earned by GSI but for the alleged breach. Three key data points give us insight into this:

    a. Actual revenues as they occurred;

    b. Revenues foregone related to the disclosure of GSI data by the Boards as this provides an important indication into the market interest in such data. It is our understanding that licensing of the pre-existing database of seismic data is a critical component of GSI's business and the Decisions stripped GSI of its ability to generate this revenue; and

    c. Revenue related to transfer and equalization fees that GSI's customers had been contractually obligated to pay, but did not due to impaired relationships stemming from litigation and failed copyright defenses.

28. Furthermore, the characterization of our methodology as a "damages machine" ignores the fact that businesses like GSI (or any other indefinite-lived businesses) are indeed "machines" designed to generate profits for shareholders on a recurring and perpetual basis. The expropriation of such a "machine" results in the loss of those future profits.

[3] Brattle Report, Paragraph 88

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29. The Brattle Report also critiques our use of the capitalized cash flow method. In this context, we're determining the but-for value of a company where certain alleged breaches have pervasively impacted that company. Under such circumstances, there is no additional benefit to using a discounted cash flow methodology; in fact, this approach would require additional speculation and unprovable assumptions. The valuation approach used in the Initial PwC Report is commonly used in valuations of Canadian businesses and fully captures industry and company-specific cyclicality.

30. Our detailed comments are laid out in the following sections, including comments related to the two normalization adjustments of revenues, the selected discount rate and its determination, and other comments made in the Brattle Report and Hobbs Report.

PwC's Detailed Comments in Response to The Brattle Report

31. In the following paragraphs, we respond to the Brattle Report's comments and critiques. Our responses are organized in the same order as the Brattle Report's detailed comments[4].

The Form of Our Damages Calculation

32. The Initial PwC Report estimated lost equity value by estimating the fair market value of GSI's equity but for the Decisions, which as described in our Background section, resulted in the expropriation of GSI's business. As part of this, we determined the fair market value of GSI under the major assumption that this alleged expropriation had not occurred. This analysis required the normalization of historical revenues and earnings in order to ultimately estimate a But-for value of GSI's equity as at November 30, 2017 and June 30, 2022.

33. The Brattle Report argues that a more appropriate quantification of damages would entail an estimation of GSI's only two valuable assets as at the Valuation Dates: its seismic data at the Valuation Dates and its remaining outstanding domestic litigation claims[5]. Brattle notes that they were instructed to assume that GSI's ability to pursue domestic claims remains intact.

[4] Which appear to begin at Paragraph 46 of the Brattle Report.
[5] Brattle Report, Section IV

34. As noted in the Claimants' Memorial, Article 1110(2) of NAFTA requires that compensation for legal expropriation shall be equivalent to fair market value immediately before the expropriation took place. It is noted, however, that Chapter 11 of NAFTA "does not provide any specific guidance on the assessment of damages or interest in accordance with Article 1135"[6] and accordingly, damages awards in this case may be tailored in such as way as to fully compensate the Claimants for their losses as a result of the alleged breaches. As per the Memorial, "a breach of an investment treaty is an internationally wrongful act that triggers the obligation to make a full reparation for the injury caused."[7]

35. Accordingly, we have defined the alleged loss incurred by the Claimants as the difference between the estimated fair market value of GSI's equity but for the alleged breaches and its actual fair market value at the Valuation Dates, which was nil.

The Independence of Our Valuation

36. The Brattle Report views the Initial PwC Report to be lacking independence[8]. In particular, the Brattle Report argues that the Initial PwC Report relies excessively on assumptions supplied by the Claimants.

37. First, we note that the Initial PwC Report contains a scope limitation, which is not mentioned in the Brattle Report's critiques. The scope limitation in the Initial PwC Report is noted below:

Due to the nature of this mandate, the sweeping and pervasive impact of Canadian Court decisions that deprived GSI the right to enforce intellectual property laws on its data (which had been disclosed by certain Canadian governmental organizations) and the passage of time between the occurrence of those disclosures and our Valuation Dates, the validity of the assumptions forming the basis of the But-for Scenario cannot be fully corroborated. We have relied on these assumptions, which have been identified in this Report as assumptions taken from Mr. Paul Einarsson's witness statement and for the purposes of this Report, treated them as facts.

38. The nature of this mandate is such that it demands the valuation of GSI under a hypothetical set of circumstances (i.e., the But-for world). This means that many of the assumptions used in such a valuation are difficult or impossible to validate, corroborate, or verify. In any case, in the following paragraphs, we note the results of additional procedures to perform, where possible, validation of assumptions. As well, throughout this PwC Reply Report, we provide clarifying rationale underlying certain key assumptions.

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[6] Claimants' Memorial, Paragraph 476
[7] Claimants' Memorial, Paragraph 479
[8] Brattle Report, Paragraph 13

39. The Brattle Report notes that the Initial PwC Report does not document analysis, review, or verification of certain unpaid invoices (the “Unpaid Invoices”) that are a key revenue normalization in our analysis[9]. The Brattle Report is correct in that we had relied on an Unpaid Invoice listing provided to us by Mr. Paul Einarsson.

40. For the purposes of this PwC Reply Report, we performed certain verification procedures related to Unpaid Invoices and the normalization related to revenues from disclosed data. The results are summarized in the bullets below.

- With respect to these Unpaid Invoices, we obtained the underlying invoices from Mr. Paul Einarsson. The Unpaid Invoice listing included 42 line items. We compared the line items in the Unpaid Invoice listing to the underlying invoices and noted one error: invoice [redacted] appears to have been [redacted] in the Unpaid Invoice listing by [redacted]. For the remainder, amounts as per the Unpaid Invoice listing agreed to their underlying invoices. The exception noted is immaterial and would ultimately not change our selection of maintainable revenues.
- With respect to the Unpaid Invoices, we also recalculated the invoice amounts and agreed pricing as per the underlying invoices to GSI’s historical price lists where invoice detail permitted such an analysis[11].

41. The results of the foregoing procedures do not warrant updates or modifications to the conclusions reached in the Initial PwC Report.

[9] Brattle Report, Paragraph 60

[10] Or 0.58% of the total normalization adjustment for unpaid invoices. [redacted]

[11] In some cases, invoices did not include pricing data or certain types of data were not apparent on historical price lists. Approximately 37.0% of the total relevant amount from Unpaid Invoices [redacted] in equalization in transfer fees included in the Unpaid Invoices) was successfully recalculated and tied back to price lists; for the remaining portion, detail in invoices was insufficient in order to perform these procedures. We noted no instances of incorrect pricing or incorrectly calculated fees. Furthermore, we noted that for some of the tested invoice items, there was a multiplier of 1.5x or 2.0x applied to GSI’s standard pricing. We understand that the price lists and GSI’s master license agreements often stipulate data minimums per survey; where less than the minimum is licensed, there is a surcharge. Similarly, where partial lines are licensed vs. full lines, we understand that there is typically a surcharge. We understand that these multipliers are intended to adjust standard pricing to include the aforementioned surcharges when applicable. For illustrative purposes, we note that the $175.8 million in tied-out equalization and transfer fees would equal approximately $133.6 million without the application of these surcharges.

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42. The Brattle Report also highlights the magnitude of the normalization adjustments to revenues[12]. It is, in our view, not surprising that these normalization adjustments to revenues drive a significant portion of GSI's But-for value. The intention of the But-for valuation exercise is to understand what the value of GSI would have been if not for the alleged breaches and these normalizations encapsulate the harm that was allegedly handed down as a result. As GSI's business was, as argued by the Claimants, allegedly expropriated by the Government of Canada, any normalization to the business's historical revenues to reverse such impacts will, of course, look fundamentally different than what had actually occurred; the significance of the normalization adjustments points to the large-scale nature of the alleged expropriation. To ignore such normalizations due to their magnitude would defeat the purpose of a But-for valuation.

Normalization for Revenues Associated with Access of Disclosed Data

43. One of our normalization adjustments to historical revenues in the Normalization Period was for the inclusion of revenues from instances where GSI's data was disclosed to various third parties (hereinafter referred to as the "Board Data") including other seismic data providers and oil and gas exploration and production companies. The Board Data detailed instances that GSI's data was accessed from 1987 to 2012.

44. The Brattle Report notes that "we have been instructed that the Boards' disclosure of GSI seismic material is not a breach of NAFTA. If so, we understand these amounts should be excluded from the analysis." [13] The Brattle Report provides no further explanation or analysis demonstrating the reasonableness of this instruction or why it is reasonable given that the subject of the claim is the Decisions.

45. The But-for valuation is intended to reflect the value of GSI had the alleged breaches (i.e., the Decisions) not occurred. Our understanding is that through the Decisions, GSI effectively lost its ability to enforce its intellectual property rights relating to its seismic data. It follows that a But-for valuation would reflect a set of circumstances where GSI would have been able to uphold its intellectual property rights. Such an ability would result in a remedy that would allow GSI to protect its copyright and, consequently, the income-producing capability of the disclosed seismic data. In order to quantify the impact that such an available remedy may have on revenues in a But-for valuation, it is necessary to consider the Board Data as this provides an important indication of the market demand for this intellectual property.

[12] Brattle Report, Paragraph 76
[13] Brattle Report, Paragraph 65

46. The Brattle Report points out that the Initial PwC Report does not document any validation or analysis of underlying prices attached to various line items in the Board Data[14]. For the purposes of this PwC Reply Report, we compared pricing as reflected in our normalization adjustment to underlying GSI price lists and noted no exceptions.

47. The Brattle Report also points out the possibility that licenses would be negotiated with customers at rates below the list price[15]. With respect to such discounts, we understand the following:

- Based on discussion with Mr. Paul Einarsson, ad hoc discounts issued by GSI to customers were not commonplace and only occurred in limited circumstances, such as volume discounts on purchases of multiple data (a well-accepted business practice). Furthermore, we understand that discounts were not offered at all from 2008 onwards.
- We also note that GSI's price lists often consider inherent volume discounts related to volume on the same survey[16].
- As well, we note that normalizations related to disclosures of Board Data were most significant in the early years of the Normalization Period. These years have less of an impact on our ultimate selection of maintainable revenues at the Valuation Dates.

48. The Board Data disclosures have been treated, for the purposes of historical revenue normalization, as instances of data licenses and accordingly, we have not factored in any ad hoc price discounts that would require arbitrary adjustments to GSI's established price lists[17].

49. Next, the Brattle Report raises the possibility of double-counting of instances where data was accessed through the Boards but then subsequently licensed from GSI[18]. It is our understanding that with the exception of one license for a small amount of data, no such instances occurred.[19]

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[14] Brattle Report, Paragraph 66
[15] Brattle Report, Paragraph 66
[16] Price lists often feature decreased pricing for additional kilometres on the same survey of data.
[17] Furthermore, it is should be noted that standard GSI pricing is for licenses that come with usage terms and restrictions. The accesses of data from the Boards resulted in unrestricted use of the data; we understand that such access and use would generally command higher pricing.
[18] Brattle Report, Paragraph 67
[19] We understand that this license was with ConocoPhillips and earned fees of less than $20,000.

50. The Brattle Report also raises the potential issue of double recovery[20]. In other words, they argue that there are certain invoices for which “GSI is seeking recovery in other venues and jurisdictions” and that such invoices may be included as part of our normalization adjustment for Unpaid Invoices. As noted earlier, we are not asserting that these Unpaid Invoices comprise a loss resulting from a breach of NAFTA. We are simply normalizing historical revenues to reflect the But-for Scenario; our valuations of GSI’s equity at November 30, 2017 and June 30, 2022 are based on prospective earnings of the company at that time in the But-for Scenario. In order to determine those prospective earnings, the historical earnings of GSI are adjusted to reflect a world in which the alleged breaches did not occur. Simply put, we do not claim past Unpaid Invoices as losses.

51. Furthermore, if any Unpaid Invoices were the subject of litigation and a full or partial damage award was received by GSI, there would be no risk of double-counting unless the damage award was reflected in actual revenues some time during the normalization period (2000 to 2012). We understand that there were no instances of damage awards being received for disputed amounts on Unpaid Invoices prior to 2012.

52. As well, the Brattle Report notes that “courts have concluded in at least some of the cases that amounts being sought by GSI for access to GSI seismic materials from the Boards are not owed.”[21] It is our understanding that in many such cases, claims may have been denied due to technical reasons such as limitation periods (i.e., the passage of time between the alleged access and the initiation of a claim). Furthermore, we understand that there were delays in the provision of the details of the Board Data to GSI from the Government of Canada, which ultimately caused delays in the resulting litigation. Regardless, the ultimate judgments of the courts do not offer any insight into the validity (or lack thereof) of any potential amounts as normalization adjustments to historical revenues.

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[20] Brattle Report, Paragraph 69
[21] Brattle Report, Paragraph 69

53. Next, the Brattle Report asserts that "the information relied upon by Mr. Sharp appears to contain errors."[22] The Brattle Report then references one error (not multiple) related to the access of certain data in 2002 that was not actually collected until 2003. It is our understanding that this was in fact an isolated error made in determining the appropriate pricing for the data[23]. This error had the total impact of overstating normalized revenues in 2002 by US$6.285 million, or 6.2% of the US$101.6 million in normalized revenues for 2002. We do not consider this to be a material amount and ultimately, it would not impact the judgmental selection of maintainable revenues. We understand that this was an isolated oversight on the part of the Claimants due to two pieces of data having similar government-assigned Project Number codes[24].

54. The Brattle Report also asserts that it is not likely that all of the Board-accessed data would have resulted in licensed data to GSI had GSI been able to maintain its copyright ownership[25]. First, they note the existence of competing data overlapping GSI data. No doubt, this data exists today and is available for licensing by oil and gas producers today.

55. One key question with respect to this data, however, is whether it would exist in the But-for world. It is our understanding that GSI, throughout much of its operating history, including the normalization period, held title to a significant proportion of the available seismic data for offshore Canada. The Hobbs Report notes that multinational competitors TGS and PGS have partnered since 2011 "on several [multi-client] campaigns off the east coast of Canada."[26] We are not aware of any other holders of significant libraries of competing data in offshore Canada. Furthermore, the 2011 inception of the TGS-PGS partnership occurred after GSI had both ceased investment in new data acquisition and sold its fleet, two events that would not have occurred in the But-for Scenario. It is possible that this TGS-PGS partnership essentially filled a market void. Without the alleged expropriation of GSI's business, this void would not have existed in the But-for Scenario.

[22] Brattle Report, Paragraph 71
[23] Pricing for Mamou 3D data (NS24-G005-008P) that had a value of $3.3 million was erroneously used in place of the correct pricing, which was for Onandaga 3D data (8624-G5-008P) that had a price of US$187,200. A 2.0x multiplier was applied as the data was accessed by BP Exploration, an exploration and production company.
[24] There were no other instances where the date of the data was requested preceded the year that the data was shot.
[25] Brattle Report, Paragraph 72
[26] Hobbs Report, Paragraph 19

56. The Brattle Report also argues that parties accessing the data may have only accessed the data because it was free and given the requirement to pay for it, they may not have[27]. While we agree with the general principle that parties are likely to "consume more of something when it is free than when it is costly"[28], the fact remains that the parties accessing the data requested access; it was actively sought, which indicates, at the very least, an active interest in the insights to be gleaned from such data[29]. Accordingly, we have accepted the assumption provided that instances of data access noted in the Board Data should be treated as instances of licensing in the But-for Scenario. Furthermore, we understand that the multipliers of 2.0x and 3.0x, which were applied as instructed, are intended to reflect an approximation of the average number of times an instance of access data would have resulted in a license fee.

57. The Brattle Report raises an argument that the vast majority of the data accessed had been old and comprised data acquired from Halliburton in 1993[30]. The Brattle Report argues that the age of the data "matters because the value of seismic data generally declines over time."[31] Although this can be true, one important factor mitigating the depreciation of data due to the passage of time is the lack of competing data. On the commercial life of non-exclusive data, the expert report of Mr. "Chip" Gordon C. Gill[32] dated September 13, 2022 (the "Gill Report") noted that:

"the length of the commercial life of non-exclusive data can vary greatly. Offshore seismic exploration only came into widespread use around 50 years ago. As such, data owners have limited experience with which to accurately judge when to expect the useful commercial life of many offshore non-exclusive seismic data survey projects will end. Because the cost of maintaining the data is generally very low, most data owners find that even the oldest data in their libraries has not yet reached the end of its commercial life."

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[27] Brattle Report, Paragraph 72
[28] Brattle Report, Paragraph 72
[29] We understand that the parties accessing the data had to request access to specific datum and then have that data copied. The data would have to be reformatted from microfiche format into SEG-Y format or similar format that can be interpreted and used. This would require an investment of time for data processing and interpretation. Furthermore, it is our understanding that copy companies earn profit from the "legwork" and expertise required to copy and reformat this type of data which is further evidence that this data has value to those who obtain it.
[30] Brattle Report, Paragraph 74
[31] Brattle Report, Paragraph 73
[32] CER-03

58. It is our understanding that for much of GSI's history up to the end of the Normalization Period, GSI owned a significant market share for Canadian offshore seismic data in large part due to a lack of quality alternatives. Presumably to a user of seismic data, when certain existing data is the only data available, its age becomes less of a concern. We note that, through the Normalization Period, revenues derived from seismic data that was created prior to the date on which the data was acquired by GSI from Haliburton in 1993 totalled approximately $37.1 million. This indicates that even after the disclosures by the Boards, GSI's back database of seismic data had revenue-producing ability.

59. The Brattle Report also points out that the pre-1993 data was acquired by Halliburton for $450,000[33]. As noted in the Initial PwC Report, an "actual market price achieved may be higher or lower than the [fair market value], depending upon the circumstances of the transaction (for example the competitive bidding environment)… The knowledge, negotiating ability and motivation of buyers and sellers… will also affect the actual market price received."[34] We understand that this transaction was unique as it formed a part of a larger settlement of multiple claims against Halliburton. We also understand that it was Mr. Davey Einarsson who had led the exploration efforts to acquire the data and, as a result, was intimately familiar with the data (likely more so than individuals at Halliburton who were responsible for negotiating the sale). Accordingly, we view the $450,000 transaction price to be a poor indication of the data's fair market value at the time of its acquisition in 1993.

60. The Brattle Report also points out that certain elements of our calculated normalization adjustments cannot be "audited"[35] and notes the fact that we did not initially provide detail regarding which multiples were applied to which line items in the underlying Board Data. It is our understanding a listing detailing the multipliers assigned to each accessing party[36] was provided prior to the submission of the Brattle Report.

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[33] Brattle Report, Paragraph 74
[34] The Initial PwC Report, Paragraph 25
[35] Brattle Report, Paragraph 14
[36] RR11.0

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61. Finally, the Brattle Report notes that "neither the Claimants nor Mr. Sharp discuss whether these licenses would relate to data of the same quality and format as available from the Boards, or whether the list price relates to the higher-quality data that we understand GSI actually provided to its licensees."[37] The pricing does relate to higher quality data, but this is not relevant. First, we understand that the technology existed at the date of the Disclosures to enhance the seismic data provided to the Boards through vectorization into a readable, interpretable digital format. Secondly, data submitted from GSI's licensees to the Boards (i.e., secondary submissions) were already in higher quality formats. We understand that these secondary submissions were also disclosed based on the Decisions.

62. Additionally, in a But-for Scenario (i.e., a scenario where GSI had been allowed the ability to enforce its copyrights), given the demand for this particular data, GSI's higher quality data would have been the only alternative available.

Normalization for Unpaid Invoices

63. First, we note that the Brattle Report's Executive Summary mischaracterizes this normalization adjustment, noting that the Initial PwC Report "assumes, in effect, that more than US$1.2 billion in third-party 'invoices' alleged to have been sent to GSI's customers from 2012 to 2016 – including for contractual disputes unrelated to the seismic material disclosed by the Respondent – not only would have been paid absent the alleged breaches, but would have in turn formed the basis of a perpetual revenue stream thereafter."[38]

64. We note that this characterization of the normalization for Unpaid Invoices is false and misleading. It is not clear exactly how the [redacted] was determined by Brattle although we note that the total amount for all invoices, including charges that have been specifically excluded from our normalization adjustment, is [redacted]. Of this, [redacted] relates to transfer and equalization fees. Our total normalization for Unpaid Invoices over the entire Normalization Period is equal to a total of [redacted] and we make no assumption regarding the collectability or the validity of any of the remaining amounts.

[37] Brattle Report, Footnote 77
[38] Brattle Report, Paragraph 13

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65. The Brattle Report argues that the Initial PwC Report points out an assumed causal link between the non-payment of invoices and the alleged invoices[39]. It is our understanding that the alleged breaches resulted in GSI losing its ability to protect its copyrights. If GSI had the ability to protect its copyrights effectively and expediently, the pervasive damage to its relationships with customers across Canada, the United States, and internationally could have been avoided. Accordingly, the But-for Scenario contemplates these relationships as largely intact. As such, routine charges that ultimately went unpaid due to severed relationships, are assumed to have been paid in normal course.

66. Some of the charges appear to have been dismissed by courts, as referenced by the Brattle Group. The fact that claims related to certain invoice charges were dismissed by courts is not a reliable indication that those invoice charges are not valid. In the event of an out-of-court settlement, for example, claims can be ultimately dismissed by the relevant court as a procedural formality. We understand that this was the case with the Anadarko invoices cited in the Brattle Report. As well, we understand that GSI had other claims dismissed because of time limitations associated with pursuing damages in those courts. These time limitations are not relevant to a normalization of historical revenues. The aim of normalizing historical revenues for the But-for Scenario is to understand the level of revenues that GSI would have been able to earn but for the alleged breaches; legal limitation periods on legal actions between GSI and its customers are not relevant to this end.

67. Next, the Brattle Report points out that some of the Unpaid Invoices included charges related to seismic data located in the Falkland Islands[40]. First, we understand that as a result of the alleged breaches, GSI suffered reputational damages across the industry, which includes operators outside of Canada; put another way, the alleged breaches impacted GSI in a pervasive way that extends beyond Canada. The But-for Scenario considers the full impact of the expropriation of the business and accordingly, impacts outside of Canada are considered relevant and valid. Furthermore, we understand that GSI's license agreements are governed by the laws of Alberta, including data licensed in areas outside of Canada. In any case, the Brattle Report refers to three invoices in particular[41], which together made up approximately 1.2% of the total normalization adjustment for Unpaid Invoices. Ultimately, the inclusion of these invoices does not materially impact our selection of maintainable revenues. Our But-for Scenario contemplates the overall value of GSI's business but for the alleged breaches. Such an analysis must consider the full impact of the alleged breaches, which we understand to extend beyond GSI's Canadian business.

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[39] Brattle Report, Paragraph 79
[40] Brattle Report, Paragraph 81
[41] Invoice [redacted], invoice [redacted], and invoice [redacted].

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68. The Brattle Report points out that the method for allocating Unpaid Invoice amount back to previous years when services were provided does not agree to the method laid out in Mr. Paul Einarsson's witness statement[42]. The Brattle Report also points out that the Claimants have provided no support or basis for their proposed method of allocation. First, we note that the difference between allocating between five years and six years would not have a significant impact on our conclusion; in fact, the method of allocation contemplated in the Initial PwC Report results in a lower total normalization adjustment[43]. Secondly, we note that this allocation is intended to provide an estimated approximation of the timing of the provision of services included in the Unpaid Invoices based on the judgment of Mr. Paul Einarsson, who had been intimately involved in the day-to-day operations of GSI. A detailed allocation based on the actual provision of services is not practical and, in some cases, may not be possible.

69. Finally, the Brattle Report notes that the amounts in the Unpaid Invoices may include penalty interest[44]. In our review of the underlying invoices, we noted no instances of penalty interest being included in the invoice amount.

NAFTA Time Limitations

70. The Brattle Report asserts that the methodology employed in our But-for valuation "evades" the time limitations of NAFTA as normalization adjustments precede a three-year limitation period[45]. As described earlier in this PwC Reply Report, it is our understanding that the November 30, 2017 Supreme Court of Canada decision was effectively an expropriation of GSI's business and accordingly, we have been instructed to consider normalization adjustments to revenues that attempt to demonstrate the revenues and earnings of GSI but for that expropriation and its ancillary effects. It is our understanding that there were ancillary effects of this expropriation.and we selected a Normalization Period of 2000 to 2012. The normalization adjustments do not "evade" the NAFTA time limitations of three years preceding a breach because, we are not claiming revenues and earnings from this period as losses; in fact, we are normalizing historical revenues in order to understand the level of revenues and earnings but for the Decisions and their ancillary effects (i.e., the But-for Scenario).

[42] Brattle Report, Paragraph 82
[43] $261.4 million between 2007 and 2012 vs. $305.4 million between 2006 and 2012.
[44] Brattle Report, Paragraph 83
[45] Brattle Report, Section V.A.3

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71. The Brattle Report also points out the fact that the annual normalizations related to Board disclosures decline over time[46]. These annual normalizations are based on the Board Data, which Mr. Paul Einarsson views to be incomplete in later years; it is our understanding that in later years the Boards no longer recorded disclosures. More importantly, our forward-looking valuations at November 30, 2017 and at June 30, 2022 contemplate annual capital expenditures equal to 9% of revenues and direct expenses equal to 20% of revenues. These costs cover the fact that GSI, in the But-for Scenario, would continue to update its data acquisition and processing equipment and software, acquire new data, and reprocess and enhance its existing data. In short, the But-for Scenario contemplates a database of seismic data that is continuously evolving, adapting to new technologies. If the But-for Scenario, for whatever reason, were to instead assume perpetual reliance on GSI's existing seismic database without update or expansion, the But-for valuation should not contemplate significant investment in capital expenditures and could likely operate with minimal direct expenses and overhead.

72. In addition, the Brattle Report characterizes our historical revenue normalizations and our But-for valuation as a "damages machine" as the normalization adjustments are considered into perpetuity[47]. The Brattle Report presents the revenue normalization process as a method through which "losses" can be continued in perpetuity.

73. The Brattle Report mischaracterizes normalization adjustments, a routine step in capitalized cash flow valuations, as "losses" or an attempt to reclaim past losses. As described earlier in this PwC Reply Report, this is simply inaccurate. In any but-for analysis, one must consider a set of circumstances and facts that differ from what actually occurred; this is the defining characteristic of a but-for analysis. The Brattle Report argues that our normalization adjustments are a mechanism designed to recover and multiply past losses. In reality and as noted previously, the intention of normalizing historical revenues is to understand the level of revenues that would have been earned by GSI but for the alleged breach. From this understanding, we can make an informed selection of maintainable revenues to be applied in our valuations of GSI at the Valuation Dates.

[46] Brattle Report, Paragraph 86
[47] Brattle Report, Paragraph 88

Maintainable Revenues

74. First, with respect to our use of regression analyses in order to determine an appropriate observable variable to consider in our illustrative extension of normalized revenues, the Brattle Report notes that "it is not surprising that Mr. Sharp does not cite any sources, academic or otherwise, to support his use of the R-squared concept in this way. R-squared is simply a measure that describes the strength of overall correlation between two sets of numbers… It does not measure how appropriate one variable will be in predicting another – correlation is not causation, and correlation can be spurious."[48]

75. However, a paper published in the Global Arbitration Review noted that:

"Regression analysis is a statistical technique that can be used to estimate the relationship between a dependent variable and one or more independent variables. The term 'dependent variable' simply means that the variable may depend on, respond to or be associated with the values of one or more other variables. Similarly, an 'independent variable' is a one that may partially determine, influence or otherwise help to predict the value of the dependent variable."

Economists use regression analysis to evaluate relationships between variables of interest in economic data or to predict future values of a variable of interest. It is in this context where regression analysis is most frequently used for damages purposes.[49]

76. There is a history of use of regression analysis and/or R-squared in international arbitrations:

a. In *Lupaka Gold Corp. v. Republic of Peru*, it appears that multiple experts employed the use of regression analysis and referenced observed R-squared results[50];

b. A regression analysis was used in *The Islamic Republic of Pakistan v. The Republic of India*[51] for damages quantification; and

c. Regression analysis was used in *Tethyan Copper Company Pty Limited v. Islamic Republic of Pakistan*[52].

77. We also note that the Initial PwC Report does not imply any causation as suggested in the Brattle Report. The aim of the regression analysis is to determine the predictive ability of various factors, including global offshore rig count, not whether those factors *cause* seismic spending.

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[48] Brattle Report, Paragraph 99. We point out that the Brattle Report employs the use of regression analysis and R-squared factors later in the Brattle Report and in paragraphs 108 and 110, makes the very implications that it warns against in paragraph 99.
[49] "The Use of Econometric and Statistical Analysis in Damages", Jennifer Vaderhart, Steven Schwartz, and Richard Brady; published in the Global Arbitration Review.
[50] ICSID Case No. ARB/20/46; First Quantum Expert Report of Isabel Santos Kunsman and Alexander Lee dated March 24, 2022, Paragraph 184
[51] Indus Waters Kishenganga Arbitration, Case No. 2011-01 in the Permanent Court of Arbitration
[52] ICSID Case No. ARB/12/1

78. The purpose of the regression analysis performed in the Initial PwC Report is to determine whether there is an objective, observable variable that can be used to bridge normalized revenues, which end in 2012 due to a lack of availability of reliable data thereafter, to the Valuation Dates. The primary rationale of using a driver such as offshore rig count (as opposed to applying a simple measure of inflation) was to capture the impacts of changes to the overall industry conditions facing GSI.

79. The Brattle Report points out that normalized revenues correlated better with global offshore rig count than with the Canadian offshore rig count[53]. The reason for this phenomenon is simple: the Canadian offshore rig count is too low to produce a meaningful correlation coefficient. Between 2003 and 2012, the relevant Canadian offshore rig count[54] ranged between one and four. With rig counts this low, a modest change of one or two rigs to the total count results in a significant swing on a percentage basis. As well, a data set with such small counts is vulnerable to the effects of "noise" (i.e., impacts of individual operator-specific events or other isolated events impacting the count). The use of global offshore rig counts avoids both of these issues to provide a view of overall industry activity and investment.

80. The Brattle Report notes certain data also referenced in the Hobbs Report on offshore seismic spending. This data was provided in an equity research analyst report from investment banker ABG Sundal Collier. The Brattle Report runs a regression, comparing annual offshore seismic spending to Brent Crude spot pricing between 1991 and 2021 and notes an R-squared of 0.75. From here, the Brattle Report then compares Brent Crude prices to GSI's direct expenses and actual revenues between 1997 and 2008, noting similar R-squared factors of 0.84 and 0.79, respectively[55].

81. First, we note a fundamental issue with any analysis that examines actual revenues: revenues in the period were impacted by accesses to GSI's seismic data that became part of the litigation that led to the Decisions. To suggest that actual revenues are a better measure of GSI's maintainable revenues in a But-for valuation ignores the impact of the alleged breaches and effectively defeats the purpose of a But-for valuation.

82. Secondly, we noted that the Brattle Report selects an end date of 2008 for its regression analyses. Had the entire Normalization Period been selected for the regression comparing Brent Crude prices and actual revenues, an R-squared of only 0.17 would have been observed, lower than the R-squared comparing global offshore rig count and normalized revenues during the Normalization Period of 0.50.

[53] Brattle Report, Section V.B
[54] We apply a one-year shift backwards for offshore rig counts as there is typically a lag between the purchase of seismic data and the drilling of a new well. So in this case, the relevant Canadian offshore rig counts for 2003 to 2012 would be from 2004 to 2013.
[55] Brattle Report, Paragraphs 107 to 110 and Figures 13, 14, and 15

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83. The Brattle Report notes that the starting point from which we begin extending normalized revenues using the annual change in global offshore rig count has an impact on illustrative extended revenues and, ultimately, the valuation[56]. This fact is not surprising to us. From 2009 to 2012, normalized revenues totalled [redacted] and included nearly the entire normalization adjustment related to Unpaid Invoices. To begin the extrapolation prior to this period would ignore what is, in our view, an important normalization in understanding GSI's But-for revenues.

84. Our Normalization Period was run to 2012 because after 2012, there is limited to no information regarding Board disclosures available. To cut off the normalization earlier than 2012 would be arbitrary and ignore important data regarding Unpaid Invoices. The Brattle Report suggests that beginning the illustrative extension of revenues in 2008 would be "consistent with [our] treatment of GSI's costs."[57] As explained in the Initial PwC Report, our determination of direct expenses are based on the 2000 to 2008 period (the "Direct Expense Reference Period") and our determination of general and administrative expenses ("G&A") is based on the 2006 to 2008 period (the "G&A Reference Period") because these periods reflect GSI's peak levels for each of these two items. Beyond 2008, both direct expenses and G&A declined significantly and GSI's operations became much more limited.

85. The Brattle Report argues that our judgmental selection of maintainable revenues is biased upwards[58]. First, the Brattle Report notes that "the range of normalized revenues that Mr. Sharp assumes for his 2017 valuation is US$105 million to US$155 million"[59], which exceeds the 2017 illustrative extended revenues of US$102 million. Brattle has incorrectly interpreted our analysis and as a result has falsely characterized it.

86. Our selected range of normalized revenues for the November 30, 2017 But-for valuation is **CA**$105 million to **CA**$155 million, which compares to 2017 illustrated extended revenues of **CA**$133 million. In other words, the Brattle Report incorrectly compares our selected range of maintainable revenues, which is stated in **Canadian** dollars, to 2017 illustrative extended revenues in **U.S.** dollars so of course the normalized revenue range appears high.

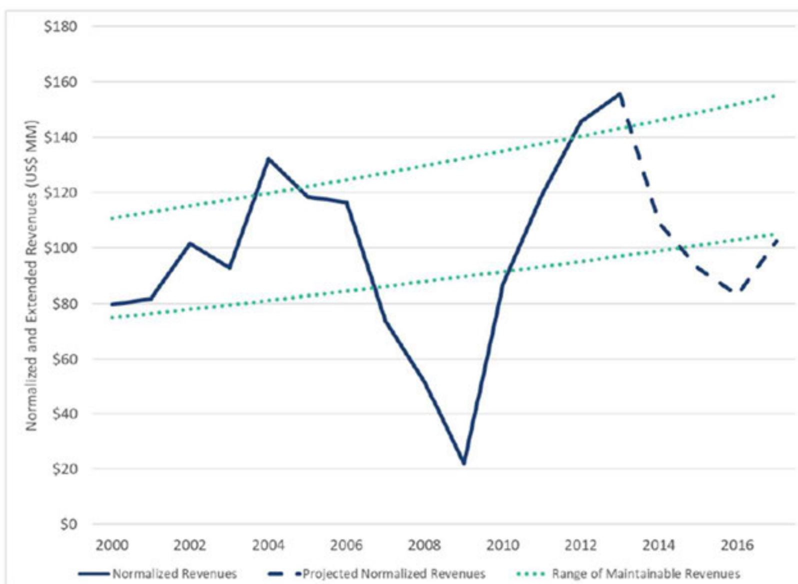
87. The Brattle Report also points out that the high end of our judgmentally selected maintainable revenues range of CA$155 million aligns with the average of GSI's five highest years of normalized revenues but the selected low end of maintainable revenues exceeds the average of GSI's five lowest years of normalized revenues.

[56] Brattle Report, Paragraph 101
[57] The Brattle Report, Paragraph 101
[58] Brattle Report, Paragraph 103
[59] Brattle Report, Paragraph 102

88. The average of the five highest years and the five lowest years was not used as the basis for our judgmental selection. With respect to the average of the five lowest years, which was CA$72 million, we note that there were only two years in the normalization period (2008 and 2009) and no years in the more recent extension period where normalized revenues were less than CA$72 million. The extension period averaged revenues of CA$128 million, which approximated the midpoint of our selected range of maintainable revenues. As well, 2017 illustrative extended revenues of CA$133 million were slightly higher than the midpoint of our selected range of maintainable revenues. These data points helped to provide us with comfort in selecting our range of CA$105 million to CA$155 million.

89. The Brattle Report, in Figure 10 (shown below), presents a chart that attempts to compare selected maintainable revenues to normalized revenues.

FIGURE 10: NORMALIZED VS. MAINTAINABLE REVENUES FROM THE SHARP REPORT[149]



90. This chart appears to show that our range of selected maintainable revenues is too high, apparently ignoring a trough observed in the 2008-2009 period. However, the following errors create a distorted chart that misleads the reader.

a. First, the currency error noted above. The Brattle Report erroneously compares selected maintainable revenues in Canadian dollars to normalized revenues in US dollars; and

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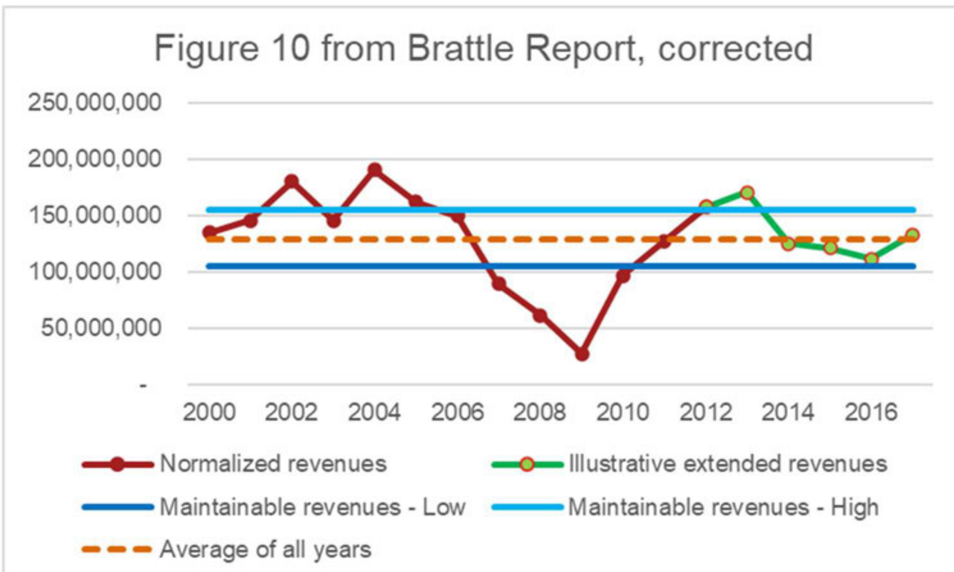
b. Second, the Brattle Report ignores the impact of inflation on revenues. They compare selected maintainable revenues, which are expressed in 2017 dollars, to normalized revenues and illustrative extended revenues without adjusting for the significant effect of inflation over time.

91. Below, we present the Brattle Report's Figure 10 chart, corrected for these two issues. Here, we see a range of selected maintainable revenues that, in our view, appropriately considers both historical peaks and troughs without favouring either.



The Relationship Between Revenues and Investment

92. The Brattle Report argues that revenues are primarily generated from investment that occurred within the preceding four years[60]. In support of this, the Brattle Report notes that in our discussion of GSI's historical operating performance (actual, not normalized), we note that "historically, revenues primarily consisted of licensing of data shot within the year and peaked between 2000 and 2008. During this period, revenues ranged from $18.5 million to $49.9 million."[61] The Brattle Report inaccurately presents this factual summary of GSI's historical revenues (pre-normalization) as a PwC view that data licensing revenues should be directly tied to investment in seismic data in any given year. To be clear, this is not a "view" held by PwC, but a statement summarizing historical actual revenues which does not, by definition, reflect the But-for Scenario.

[60] Brattle Report, Paragraph 104
[61] Initial PwC Report, Paragraph 59

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93. The Brattle Report also effectively demonstrates a strong historical relationship in the 2000 to 2008 period between actual revenues and direct expenses. This observation is not surprising to us. It is our understanding that the 2000 to 2008 period was impacted by accesses to GSI's seismic data that became part of the litigation that led to the Decisions. As a result, GSI's ability to attract license fees from its existing database of seismic data was impaired. Consequently, nearly all of its actual revenues came, not from previously shot data, but from recently acquired data.

94. Our But-for valuation normalizes historical revenues for the impact that the alleged breaches had, which includes the impact of the loss of copyrights that were critical in protecting the income-generating ability of GSI's seismic data.

95. The Brattle Report also points out the weak relationship between GSI's direct spending and normalized revenues[62]. Once again, this is not surprising to us. Due to the now inactionable disclosures of data, one key component of GSI's revenue-producing ability disappeared: its ability to generate licenses from its back database of seismic data. Naturally, there is a strong relationship between *actual* historical revenues and *actual* historical direct expenses; by this point in GSI's history, and without the ability to generate significant licensing of their existing database, their main means to generate revenues was to obtain new data. Similarly, it makes sense that there is a weak relationship between normalized revenues and actual direct expenses. Normalized revenues add back the portion of revenues that disappeared after the alleged breaches: revenues from GSI's back database of seismic data. Because these revenues can be earned with little to no direct costs, adding these revenues back will have the effect of weakening the observed relationship between revenues and costs.

GSI's But-for Expenses

96. The Initial PwC Report assumes direct expenses as a percentage of normalized revenues to be 20.1%, or the average of direct expenses as a percentage of normalized revenues over the "Direct Expense Reference Period. We understand that the Direct Expense Reference Period reflects GSI's peak activity from the perspective of data acquisition and licensing.

[62] Brattle Report, Paragraph 112 and Figure 16

97. The Brattle Report argues that the Initial PwC Report "assumes a simple, stable relationship between direct expenses and normalized revenues where one clearly does not exist"[63] and points to the fact that direct expenses as a percentage of revenues during the Direct Expense Reference Period ranged between [redacted]% and [redacted]%. To be clear, we are not assuming that direct expenses will be exactly equal to [redacted]% of revenues every year beyond the Valuation Dates. In fact, we agree with the Brattle Report that there is likely no simple, stable relationship between direct expenses and normalized revenues.

98. In selecting an appropriate and maintainable level of direct expenses that adequately support revenues, we believe that the most appropriate method is to look at historical direct expenses as a percentage of normalized revenues. By taking an average, such as we have, we acknowledge that in a But-for future, some years may exceed [redacted]% and some years may have lower expenditures that are less than [redacted]%. In a capitalized cash flow, we are determining the value of an enterprise using a single estimate of revenues, expenses, earnings, and ultimately cash flows. In doing so, we must select a level of maintainable earnings that considers future "peaks" and future "troughs" driven by industry activity, commodity price cycles, and other external and internal factors. By using the average expenses over the Direct Expense Reference Period, we capture the level of expenses, relative to revenues, incurred over the period.

99. The Brattle Report also points out that direct expenses as a percentage of normalized revenues were "climbing" towards the end of the Direct Expense Reference Period. It is true that the last years of the Direct Expense Reference Period period saw the highest level of expenses as a percentage of normalized revenues[64]:

Year	Direct Expenses	Normalized Revenues	%
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]			[redacted]

[63] Brattle Report, Paragraph 118
[64] Data from Initial PwC Report, Schedules B2.2 and C2.2

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100. It should be noted that normalized revenues in 2007 and 2008, the last two years of the Direct Expense Reference Period, have the lowest normalized revenue amounts. It is logical that in a year with lower revenues, direct expenses as a percentage of revenues would be higher. Direct expenses include both variable expenses (i.e., expenses that vary with the level of revenues) and fixed expenses (expenses that do not vary with the level of sales). As a result, in years when revenues are higher, direct expenses as a percentage of revenues would be lower; this is because only a portion of direct expenses moves with revenues while the remaining portion remains the same no matter the amount of revenues. The inverse is also true. In years when revenues are lower, whether caused by industry factors or otherwise, direct costs as a percentage of revenues will be higher as only a portion of those direct costs are variable; the remaining costs (i.e., fixed costs) make up a larger percentage of revenues simply because revenues are lower.

101. Additionally, years with higher revenues would see more instances of licensing and, likely, more low-cost licensing (e.g., licensing of data acquired in previous years, more instances of selling the same data multiple times, etc.) On these instances of licensing, GSI would have the ability to earn a higher margin. Conversely, in years when revenues are generally lower, its likely that low-cost instances of licensing are similarly lower. Accordingly, one would expect to see direct costs form a higher proportion of revenues.

102. As described earlier, the underlying logic behind using the average of the Direct Expense Reference Period to determine an appropriate level of direct expenses is that it captures both more profitable years (i.e., higher margins, lower direct costs) and less profitable years (lower margins, higher direct costs).

G&A Expenses

103. In the Initial PwC Report, G&A was determined based on an average over the three-year period G&A Reference Period (2006 to 2008). We understand that this period represents the highest level of G&A activity sustained over a multi-year period in GSI's history[65] and reflects the level of overhead required to sustain the But-for business.

[65] The Brattle Report correctly points out that in 2000, G&A totaled $6.7 million, which was higher than the amounts noted in 2006, 2007, or 2008. The period appears to be an anomaly, however. The year prior, in 1999, G&A was only $2.6 million and the following year, 2001, G&A was $4.8 million.

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Maintainable EBITDA

104. The Brattle Report points out the fact that the implied maintainable EBITDA margin of approximately [redacted] was high relative to normalized TTM[67] EBITDA margins[68] of selected guideline public companies[69].

105. With respect to our normalization adjustments for revenue, those relate primarily to data that had been shot and processed in past years. For example, with respect to our normalizations related to the Board Data, it's our understanding that it is not likely that they would have incurred material incremental expenses in order to realize such revenues; the data had been a part of GSI's database of seismic data and it would have been a simple, straightforward exercise to provide such materials to paying customers.

106. With respect to Unpaid Invoices, we understand that the services provided related to this particular normalization had already been provided; accordingly, we don't believe that any additional costs associated with the provision of those services would be necessary to recognize in our But-for valuation.

107. Our comparison of GSI's implied normalized EBITDA multiple to that of guideline public companies was intended to provide a high-level, secondary check with respect to maintainable EBITDA. We do agree that the implied EBITDA margin of approximately [redacted]% is on the high side of guideline public companies. We note, however, that GSI's business model is unlike many of the guideline public companies as GSI's revenues are primarily driven by licensing fees from non-exclusive (i.e., multi-client) data to a greater extent than many of the other data providers. The advantage of non-exclusive data is that multiple instances of revenues can be generated from the same data with little to no increase in direct costs. Furthermore, GSI is a private company that does not incur the same reporting and compliance costs borne by publicly-listed companies.

108. Pulse Seismic has a similar business model wherein the majority of revenues come from licensed non-exclusive data. We also understand TGS is another global player that has a similar business model that is focussed on licensing its data. We noted that these two businesses had the highest EBITDA margins (before adjustment for new data acquisition costs); TTM EBITDA margins at November 30, 2017 were 85.5% and 86.6% for Pulse Seismic and TGS, respectively. At June 30, 2022, TTM EBITDA margins for Pulse Seismic and TGS were 84.4% and 83.1%, respectively.

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[66] Midpoint noted at Schedule B2 of the Initial PwC Report
[67] Trailing twelve months
[68] TTM was normalized by us in the Initial PwC Report to reflect the fact that some many companies in the industry capitalize their data acquisition costs. Unadjusted EBITDA margins were higher and averaged (excluding companies with negative EBITDA) 51.5% EBITDA margins.
[69] Brattle Report, Paragraph 128

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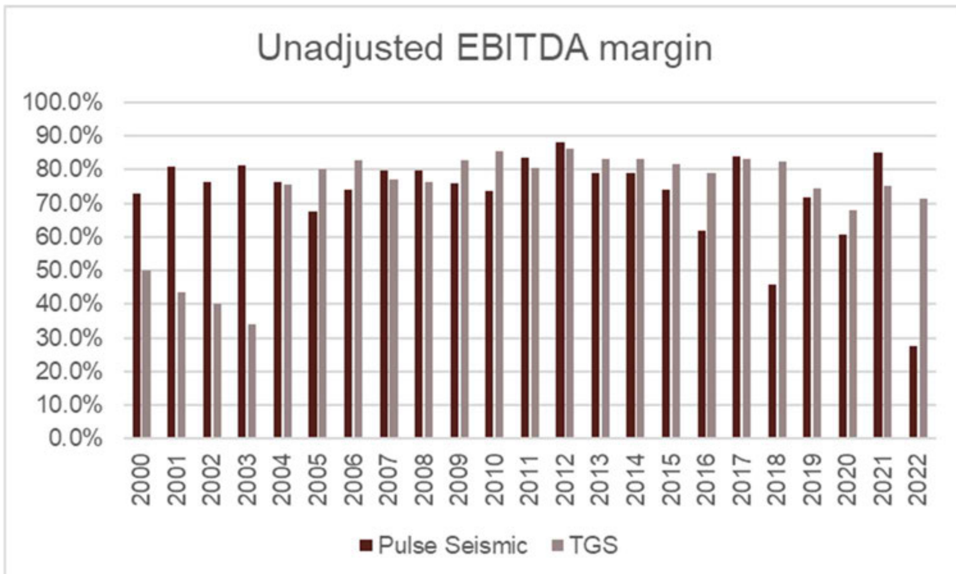
109. Furthermore, between 2000 and 2022, Pulse Seismic average unadjusted EBITDA of 73.0% and TGS averaged unadjusted EBITDA of 72.8%. The following chart depicts each company's unadjusted EBITDA margins during this period.



110. The Initial PwC Report and the Brattle Report present and discuss normalized, or adjusted, EBITDA. The difference between unadjusted EBITDA (shown in the previous table) and normalized EBITDA is the treatment of seismic data retrieval costs; some companies expense these costs and some companies capitalize them. Normalized EBITDA, as calculated in the Initial PwC Report is our attempt to show EBITDA on a common basis with GSI (i.e., with data acquisition costs deducted as an expense).

111. While normalized EBITDA is helpful to understand, it is important not to analyze this figure in isolation. It is possible, for example that some of these costs include costs related to surveys that are still in progress and not yet generating revenues. Similarly, some of these costs may have been incurred near the end of a company's fiscal year; this means that even though those costs would be fully deducted from EBITDA in calculating normalized EBITDA, those costs' contributions to revenues and the bottom line may not be yet reflected in EBITDA. Accordingly, we believe that normalized EBITDA margin and unadjusted EBITDA margin should both be considered.

112. With that understanding and given the unadjusted and normalized EBITDA margins observed for the two guideline public companies with the business models that are, in our view, most similar to GSI, we believe that the guideline public company data provides support for GSI's normalized EBITDA margins.

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113. Furthermore, and perhaps most importantly, we again stress that our comparison of normalized EBITDA margin in the But-for Scenario to the guideline public companies is not a primary determinant of EBITDA margin. Rather, it is intended to serve as a test of reasonableness to our primary approach, which considers normalized revenues, historical direct expenses, and historical G&A. An approach that ignores GSI's past results and the normalization adjustments to revenues necessary to reflect the But-for Scenario, and instead relies on data from somewhat comparable companies is simply not methodologically sound.

Capital Expenditures

114. The Brattle Report points out that capital expenditures considered in the Initial PwC Report's But-for valuations of [redacted]% of revenues were not supported[70]. The estimate of [redacted]% of revenues came from Mr. Paul Einarsson's Witness Statement. Due to the nature of the GSI business, we believe that it is most appropriate to rely on the expertise of Mr. Paul Einarsson.

115. We further note that GSI's historical capital expenditures, net of disposals, supported Mr. Paul Einarsson's estimate of [redacted]% of revenues. Actual capital expenditures between 2000 (the beginning of our Normalization Period) and 2008 (the year before which GSI divested of much of its marine exploration vessels) averaged [redacted]%, marginally higher than the [redacted]% provided by Mr. Paul Einarsson. We note that this period considers the purchase of two vessels, expenditures that are not likely to recur frequently in the future.

116. We also considered capital expenditures as a percentage of revenues for TGS and Pulse, the two companies most comparable to GSI. We noted that between 2000 and 2022, TGS's net capital expenditures as a percentage of revenues[71] ranged between -0.4%[72] and 6.0% and averaged 2.2%. For Pulse, net capital expenditures averaged 0.7% of revenues and ranged between 0.0% and 4.4%. We note that GSI's spending exceeded both companies; however, we still view GSI's operating history and the view of GSI management to be the best indications of the company's spending in the But-for Scenario. We understand that GSI owned and had invested in the assets to create new seismic data (e.g., ships) while the other companies often chartered or leased their vessels for data acquisition purposes.

117. Based on the foregoing, we find support for the assumed level of capital expenditures as a percentage of revenues.

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[70] Brattle Report, Paragraph 133

[71] Net capital expenditures determined as capital expenditures minus sales of capital equipment as per the company's cash flow statements.

[72] Sales of capital equipment exceeded capital expenditures in this year.

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GSI's Tax Rate

118. The Brattle Report points out the fact that the Initial PwC Report does not show underlying calculations for the applied tax rates of 27.5% and 25.5% for the But-for valuations at November 30, 2017 and June 30, 2022, respectively[73]. The tax rates reflect combined tax rates that include provincial taxes (Alberta and Nova Scotia) and Canadian federal taxes.

119. The underlying numbers were calculated entirely based on the tax returns that were provided with the Initial PwC Report; they come from Schedule 5 of GSI's corporate tax returns in 2006, 2007, and 2008 which were disclosed to Brattle. Schedule 5 calculates the average weighting of provincial taxes based on mandated factors such as salaries and wages paid in each jurisdiction, and gross revenues earned in each jurisdiction. This calculation is done at Schedule 5 for Canadian corporations operating in multiple provinces and would be readily apparent to any reviewer of a corporate tax return with a knowledge of Canadian corporation income taxes. The weightings calculated in 2006, 2007, and 2008 are then averaged to determine the tax rates applied in our But-for valuation.

Weighted Average Cost of Capital

120. In the Initial PwC Report, we calculate a weighted average cost of capital ("WACC") at November 30, 2017 of 15.5% to 18.5% (Schedule B3). This WACC is then applied in the calculation of our November 30, 2017 capitalization rate at Schedule B1, which is used to determine the But-for enterprise value of GSI.

121. The Brattle Report notes that our November 30, 2017 WACC build-up at Schedule B3 includes a company-specific premium of 10% to 15%[74]. The Brattle Report argues that "corporate finance textbooks used in business schools around the world warn against using such fudge factors in the discount rate to account for company-specific risks rather than modelling their effect on cash flows."[75] The Brattle Report also notes that "WACC is not company-specific, because it seeks to capture systematic risks common to all firms in a sector."[76] We disagree with this assertion.

122. The cost of capital for a single investment is intended to capture two broad categories of risks: systematic risks and unsystematic risks (i.e., risks specific to a particular entity). *Canada Valuation Service*, a text commonly cited by Canadian business valuation professionals notes that:

[73] Brattle Report, Paragraph 134
[74] Brattle Report, Paragraph 136
[75] Brattle Report, Paragraph 137
[76] Brattle Report, Paragraph 136

"the derivation of discount/capitalization rates to be applied in the valuation of privately-held business interests requires the application of careful informed judgment to the particular circumstances. It is by no means a mechanical exercise. The capitalization rate should represent a highly plausible synthesis of information concerning the risk, return, growth prospects and overall expectations of the specific business entity.

Throughout the process of information gathering, analysis, and interpretation, one basic question must be answered when deciding on an appropriate range of capitalization rates. That question is generally, "What rate of return would a rational and prudent purchaser require before he would put capital at risk in the expectation of realizing upon the opportunities associated with this specific business?"[77]

123. Furthermore, *The Valuation of Business Interests*, another text commonly used by Canadian valuation professionals notes that:

The base rate of return, being a return on unlevered equity, reflects a starting point when determining an appropriate rate of return to be adopted when valuing the en bloc equity in a given business. As previously noted, adjustments to the base rate of return may be required for business-specific risk factors.[78]

124. The text goes on to note:

"Business specific (or internal) risk factors are those particular to a business not accounted for in an assessment of industry risk factors. An upward or downward adjustment in the rate of return may be required where a business faces more or less risk than does its industry in general. Where the base rate of return and the cash flow projections do not adequately reflect the specific risks or opportunities of the business being valued, adjustments should be made to the base rate of return. Identifying the critical factors influencing the direction, opportunities and potential of a business is essential to the determination of an appropriate discount rate. Each such factor viewed separately may have a positive or negative effect on the discount rate, and a melding of these positives and negatives will contribute to the selection of an appropriate discount rate.

The adjustment for business specific (or 'unsystematic') risk in the derivation of a discount rate is one of the fundamental differences between public market securities analysis and the derivation of discount rates pursuant to a long term en bloc equity investment."[79]

[77] Canada Valuation Service, 2010 Student Edition, 5B-86
[78] Ian. R. Campbell and Howard E. Johnson, The Valuation of Business Interests, pg. 296
[79] The Valuation of Business Interests, pg. 296

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125. In our WACC, the portion of the rate of return capturing systematic risk is determined through a somewhat mechanical process. Once guideline public companies are selected, the Capital Asset Pricing Model is used to determine the portion of the cost of equity relating to systematic risks. From here, we add a size premium and a judgmentally-selected company-specific risk premium which captures other risks associated with GSI that are not common to guideline public companies.

126. The Brattle Report appears to suggest that instead of adding a company-specific risk premium, a better approach would be to manually adjust cash flows in order to avoid the use of a judgmentally selected company-specific risk premium. While in certain circumstances, the approach of manually adjusting cash flows to "strip out" forecast risk is a valid methodology, we note that a company-specific risk premium captures all unique (i.e., unsystematic) risks, not only the risk inherent in a particular estimate of future earnings (in this case, estimated maintainable discretionary cash flow). Furthermore, given the nature of the But-for valuation, it would be impossible to accurately adjust cash flows to remove all achievement risk. Ultimately, such adjustments to cash flows would be just as judgmental as our selection of a 10% to 15% company-specific risk premium. We note that the Brattle Report does not provide an alternative adjustment to manually adjust cash flows.

127. Our selection of a 10% to 15% company-specific risk premium is based on our judgment and experience valuing businesses in this industry and the energy sector[80]. Such a judgmental premium cannot be "calculated" or scientifically determined. We can, however, test the reasonableness of our overall But-for enterprise value conclusions, by reviewing implied EV/EBITDA multiples. If, for example, we had selected a company-specific risk premium that is too low and as a result, we applied a discount rate that was too low, the implied EV/EBITDA multiples would be unjustifiably high. Similarly, a company-specific risk premium that is too high would result in low multiples that would be similarly difficult to justify[81]. Our review of EV/maintainable EBITDA is discussed further in the Initial PwC Report and again later in this PwC Reply Report.

128. Next, the Brattle Report notes that our WACC considered a cost of debt reflective of BBB-rated corporate debt. In viewing this cost of debt, the fact that we are determining the value of GSI assuming a But-for scenario must be considered. We believe that GSI would have a high level of creditworthiness given the level of estimated maintainable discretionary cash flows generated by GSI's revenues (approximately 46% in the November 30, 2017 But-for valuation), meaning it would generate significant funds to service its debt.

[80] We refer the reader to Mr. Sharp's CV. In addition to the dispute-specific qualifications noted therein, Mr. Sharp's experience includes extensive experience valuing businesses in all facets of the Canadian energy sector including seismic data providers, oilfield service providers, exploration and production companies, midstream companies (i.e., resource transportation and storage), and downstream companies (i.e., refiners and refineries, retail and wholesale fuel sales and logistics, etc.)
[81] We note that this test of reasonableness assumes EBITDA is reasonable and is not a test of EBITDA but a test of the values suggested after arriving at EBITDA.

129. In order to get a sense of GSI's *actual* approximate credit rating, we requested debt agreements from GSI and obtained five loan agreements between January 2006 and September 2009; the agreements were for various types of loans including variable rate loans and equipment financing loans. We compared the implied all-in interest rates to market data contemporaneous with the issuance of the loan and noted that, overall, GSI's borrowings appeared to have implied a credit rating between a B and BB. Using the midpoint of 20-year Canadian corporate debt rated B[82] and BB[83] at November 30, 2017, we noted an interest rate of 6.729%. Using this rate instead of the 4.39% currently uses, GSI's WACC would increase by 100 basis points from a range of 15.5% - 18.5% to 16.5% - 19.5%. Increasing the applied discount rate would decrease GSI's But-for enterprise value midpoint from $406.0 million to $380.4 million, a decrease of 6.3%.

130. In any case, and most importantly, using a debt rating for GSI that reflects its *actual* creditworthiness is not consistent with the principles of a but-for valuation and ignores the Decisions and their ancillary effects. It is our understanding that the period of borrowing examined in the above-described analysis (2006 to 2009) suffered impacts from the ancillary effects of the Decisions. Accordingly, we do not view any revision to the cost of debt applied in the But-for valuation of GSI to be appropriate.

Use of the CCF Method

131. The Brattle Report argues that the use of a CCF method is not appropriate and "does nothing to overcome the obstacles of a proper [discounted cash flow] model. We noted in the Initial PwC Report that GSI "did not have multi-year forecasts that contemplated the But-for Scenario at the Valuation Dates."[84] The Brattle Report also suggests that "the task of developing multi-year forecasts often falls to the quantum expert."[85]

132. The difference between a discounted cash flow method ("DCF") and a CCF is that the former typically incorporates cash flows from a multi-year forecast[86] before which a terminal value is considered. A CCF, on the other hand, skips the discrete period forecast and goes straight to the terminal value calculation.

[82] 7.609%
[83] 5.849%
[84] Initial PwC Report, Paragraph 75.2
[85] Brattle Report, Paragraph 143
[86] In our experience, most often five years but there are no rules in this regard and the appropriate length depends on the type of business.

133. In a typical DCF valuation, discretely modelled cash flows in the near-term are important to understand as they can capture near-term nuances with respect to many factors influencing a business's value such as expected revenue growth, expected margin fluctuations, one-off capital expenditures, etc. To provide an example, for a company that is expected to grow rapidly in the next few years, a DCF is ideal as this high growth can be captured in the discrete period forecast. Eventually that growth would be expected to stabilize to a sustainable, long-term level; at this point, a terminal value is typically applied.

134. In the case of GSI's But-for valuation, we are contemplating a set of circumstances that, by definition, did not occur. And as described earlier in this PwC Reply Report, it is our understanding that the alleged breaches occurred on November 30, 2017 and had ancillary effects. Because of these ancillary effects, the act of compiling a discrete multi-year forecast at November 30, 2017 would be misleading and pointless.

135. The creation of a multi-year But-for Scenario forecast as at November 30, 2017 would entail an even higher number of assumptions and uncertainty relative to a maintainable EBITDA determination. In addition to having to determine discretionary cash flows on a maintainable long-term basis for the But-for Scenario, one would have to also make assumptions for near-term EBITDA margins, near-term revenue growth, near-term capital expenditures, and other assumptions for each year in the discrete forecast period. Such an exercise adds no value and carries the risk of implying to the reader a level of precision that is completely false.

136. The CCF presented in the Initial PwC Report avoids this exercise and instead focuses on determining, *as a range*, a level of revenues, earnings and, ultimately, after-tax cash flows that is maintainable in the long-term. As noted earlier in this PwC Reply Report, this range is intended to capture the "peaks" and "troughs" that GSI faces in a commodity-based business. Furthermore, our long-term growth rate of 2.0% approximates long-term Canadian inflation targets, implying real growth of 0%.

Tests of Reasonableness

137. The Brattle Report argues that the Initial PwC Report's tests of reasonableness are invalid[87]. In particular, the Brattle Report notes that guideline public companies, to which implied EBITDA multiples are compared, are going concerns, while GSI, was not at the Valuation Dates.

138. As described in the Initial PwC Report and in this PwC Reply Report, in the But-for Scenario, GSI was a going concern at the Valuation Dates. It is our understanding that any valuation of GSI that only considers the company's actual circumstances at November 30, 2017 (i.e., a liquidation value) would not adequately capture the impacts of the alleged breaches.

[87] Brattle Report, Paragraph 145

139. The Brattle Report also points out an inherent circularity in our review of EBITDA multiples[88]. Our But-for enterprise value requires first the determination of maintainable EBITDA in the But-for Scenario, which is then used to calculate an implied EBITDA multiple.

140. Under normal circumstances, a valuator would often examine TTM EBITDA or NTM[89] EBITDA. Due to the nature of the But-for valuation, this type of validation is simply not possible.

141. The primary intention of our review of implied maintainable EBITDA multiples is to help calibrate an appropriate discount rate for the business. In our view, the use of EBITDA multiples, whether EBITDA has been determined as part of the But-for valuation or not, is useful to this end. As explained earlier in this PwC Reply Report, a very high implied EBITDA multiple would suggest that our discount rate is too low; conversely, a too-low EBITDA multiple indicates that the discount rate is too high. The examination of implied EBITDA multiples on the basis of maintainable EBITDA, is in our experience, very commonplace and a necessary step in estimating the value of a business under a CCF approach.

142. It is also important to note that we are not reviewing implied EV/EBITDA multiples for the purposes of justifying maintainable EBITDA. The purpose of this test is to evaluate our enterprise value conclusion given a certain level of EBITDA.

The Actual Value of GSI at the Valuation Dates

143. The Brattle Report notes that GSI was not a going concern immediately prior to the alleged expropriation. Although we agree that GSI was not a going concern after the Decisions, we understand that the litigation giving rise to the Decisions had contributing, detrimental effects.

144. It is argued in the Claimants' Memorial that any damages award may be tailored in such a way as to fully compensate the Claimants for their losses as a result of the alleged breaches. As per the Memorial, "a breach of an investment treaty is an internationally wrongful act that triggers the obligation to make a full reparation for the injury caused."[90] Accordingly, it is our understanding that any quantification of such damages must consider the complete effect of the alleged breaches and in the Initial PwC Report, we perform a But-for valuation that considers exactly this. We have performed our analysis with the overarching view that the fact that GSI was not a going concern immediately prior to the point in time at which the alleged expropriation was formally crystallized (i.e., November 30, 2017) should not impact the quantum of damages.

[88] Brattle Report, Paragraph 147
[89] Next twelve months
[90] Claimants' Memorial, Paragraph 479

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145. The Brattle Report also lists and describes several “causes” of GSI’s decline[91]. We discuss each of these in the following paragraphs.

146. First the Brattle Report argues that “GSI was facing a crisis in 2001”[92]. The Brattle Report’s evidence of this crisis is limited to an out-of-context quote provided from the testimony of GSI’s ex-controller, Mr. Wayne Lam, from a 2009 trial through which GSI was seeking to recover stolen funds. We understand that the “crisis” referenced by the Brattle Report and Mr. Wayne Lam was an isolated incident caused by an employee of GSI who had misappropriated the company’s funds. We understand that this litigation concluded with a judgment in favour of GSI. After 2001, GSI went on to have several profitable years.

147. Next, The Brattle Report observes that “GSI’s accounts show minimal equity in the years that followed the 2001 crisis”[93] based on a review of the December 31 book value of shareholders’ equity for the years 2001 through 2011. Firstly, we note that the book value of equity is an accounting construct that is not an accurate indication of the value of a company as it does not reflect the value of internally-generated goodwill or other intangible assets, the appreciation in value of other tangible assets, or any expected revenue or earnings growth. This is especially true for private companies where income minimization for tax purposes is desired. More importantly, it is our understanding that because of the alleged breaches, GSI’s profit was significantly reduced and the book value of its equity (and more specifically, its retained earnings) were lower than they would have been in the But-for Scenario.

148. Furthermore, as a privately held entity, it should be noted that with respect to the presentation of operating results, GSI was primarily concerned with the minimization of income taxes as opposed to maximizing net income and retained earnings.

149. The Brattle Report also points out that GSI’s positive equity in 2005 “was quickly depleted through the payment of extraordinary bonuses to the company’s officers and directors.”[94] It is our understanding that bonuses were paid as part of a tax planning strategy (a common practice for privately held companies in Canada) where bonuses are paid to owner-executives to reduce taxable income and are then lent back to the corporation via shareholder loans. We note that GSI’s advances from related parties (the account that includes loans from shareholders) increased from nil in 2006 to $5.0 million in 2006, $10.8 million in 2007, and $12.1 million in 2008. In contrast to the assertions of the Brattle Report, it is our understanding that these bonuses remained in the company.

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[91] Brattle Report, Section VI.A.2
[92] Brattle Report, Paragraph 161
[93] Brattle Report, Paragraph 162
[94] Brattle Report, Paragraph 162

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150. Secondly, and more importantly, it is our understanding that the alleged expropriation, as described earlier, had ancillary effects. GSI's historical financial information should be viewed through this lens. The Brattle Report also argues that "losses arising from GSI's purchase of vessels were a primary cause of GSI's demise."[95] Again, it is our understanding that 2008 results include the ancillary effects of the alleged expropriation as it falls in the Litigation Period; GSI had commenced legal actions against certain customers in the pursuit of enforcing its copyrights and confidentiality. In doing so, those relationships were harmed.

151. Furthermore, it is not clear what data or source the Brattle Report relies upon in its assertion that GSI's purchase of vessels was a "primary cause of GSI's demise." The Brattle Report notes that between 2008 to 2010, GSI's ships were written down $8.3 million[96]; this accounting appears to be used by the Brattle Report as a confirmation that the purchase of ships years earlier was a failed venture. The Brattle Report's conjecture ignores the fact that the 2008 to 2010 period was negatively impacted by the ancillary effects of the Decisions. It also disregards the fact that GSI had actually been profitable after the purchase of ships; GSI's EBITDA was positive until 2014 and its net income was positive in 2011, 2012, and 2013.

152. Next, the Brattle Report asserts that "GSI suffered significant losses from investments in the Falkland Islands."[97] It is our understanding that GSI has since recouped its investment in data in the Falkland Islands.

153. The Brattle Report also points out that "GSI was facing competition from newer, better data."[98] As noted earlier in this PwC Reply Report, it's not clear whether this data would exist in the But-for Scenario. We understand that GSI held, throughout much of its history, significant market share in offshore Canadian waters. In a But-for Scenario, GSI could have continued to enhance and improve its Canadian offshore seismic database and/or created new data with newer technologies[99]. It is our understanding that in the But-for Scenario, the alleged breaches stripped GSI of its ability to do these things. It is possible that more recent competition had emerged in order to fill the void left by GSI after the impacts of the alleged expropriation had fully taken hold.

[95] Brattle Report, Paragraph 163
[96] Brattle Report, Paragraph 164
[97] Brattle Report, Paragraph 165
[98] Brattle Report, Paragraph 166
[99] It is our understanding that newer data is not necessarily preferred by data users. Some users may prefer lower-cost, less detailed data to use for high-level planning purposes as this data can be perfectly adequate for such purposes.

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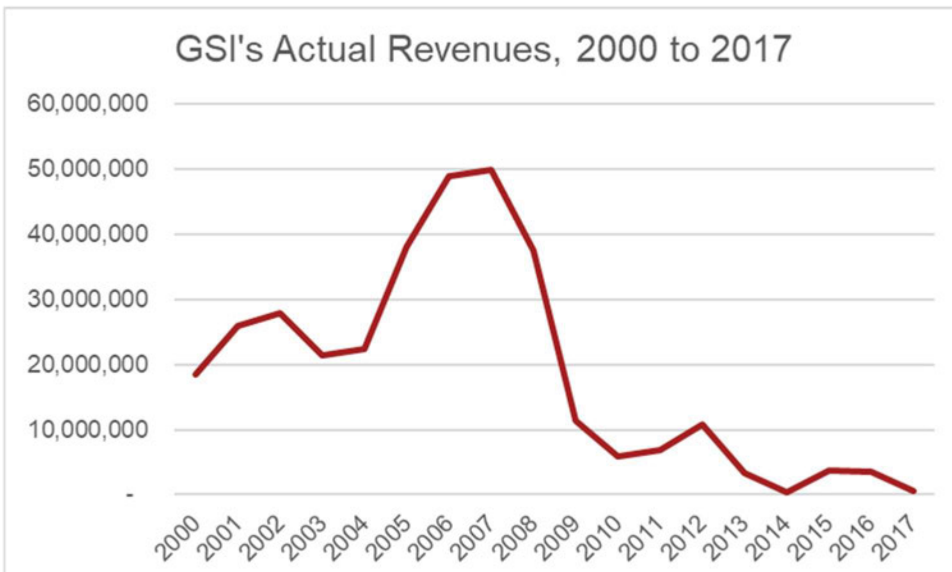
154. The Brattle Report also notes that GSI's 2008 financial statements, audited by Deloitte, included note disclosure indicating uncertainty regarding the company's ability to continue as a going concern[100]. We note that by this time, GSI had commenced litigation to enforce its copyright in its seismic data (which ultimately resulted in the Decisions).

155. It is our understanding that the decline of GSI began in 2008, which coincides with the early stages of the Litigation Period. We present, in the table below, GSI's actual revenues from 2000 to 2017. It can be seen that revenues had trended upwards from 2000 to 2007 and from 2008 onwards dropped precipitously and never recovered as GSI had become involved in litigation.



156. Ultimately, the Brattle Report concludes, based on a number of factors, that GSI was not a going concern beyond 2012[101] and may have ceased to be a going concern even before this[102]. It is our understanding that the deterioration in GSI's business was largely a result of the alleged expropriation and its ancillary effects. Ultimately in the But-for Scenario, which contemplates a scenario where GSI had been granted judgments in its favour and the alleged expropriation (along with its ancillary effects) did not occur, GSI would have continued to be a going concern or would have been compensated as if it was a going concern.

[100] Brattle Report, Paragraph 168
[101] Brattle Report, Paragraph 171
[102] Brattle Report, Paragraph 177

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The Brattle Report's Suggested Use of a Liquidation Value

157. The Brattle Report has argued that because GSI was not a going concern immediately before November 30, 2017 the most appropriate valuation method is one that contemplates a liquidation scenario[103].

158. Our understanding, however, is that the alleged expropriation, which occurred on November 30, 2017, had ancillary effects that include the impact of the litigation. A liquidation approach does not consider the fact that but for the alleged expropriation and its ancillary effects, GSI would have been granted judgments in its litigation and cash awards that would have changed its ability to continue as a going concern and generate earnings for its shareholders. Simply put, a liquidation approach would not capture the But-for value of GSI but instead the *actual* value of GSI at the Valuation Dates[104]. As a result, a liquidation-based approach would completely fail to quantify any of the impacts of the alleged expropriation including its ancillary effects.

159. As noted earlier in this PwC Reply Report, we understand that the Claimants' position with respect to damages is that "a breach of an investment treaty is an internationally wrongful act that triggers the obligation to make a full reparation for the injury caused."[105] Accordingly, we have been instructed to estimate the alleged losses incurred by the Claimants as the difference between the estimated fair market value of GSI's equity but for the alleged breaches – which we understand occurred on November 30, 2017 but had ancillary effects – and its actual fair market value at the Valuation Dates, which was nil.

Seismic Data Value

160. The Brattle Report notes that the But-for value of GSI is "capped at the value of GSI's seismic data library but for the alleged breaches minus [the negative book value of GSI's equity at November 30, 2017[106]]."[107] The Brattle Report goes on to note that the alleged breaches did not destroy the full value of GSI's seismic data library.[108] Accordingly, the Brattle Report, argues that GSI's actual value at November 30, 2017 may not be $nil.

[103] Brattle Report, Paragraph VI.B
[104] We further note that PwC does not have the expertise required to perform a detailed valuation of the seismic data.
[105] Claimants' Memorial, Paragraph 479
[106] $1.2 million
[107] Brattle Report, Paragraph 187
[108] Brattle Report, Section VI.D

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161. The Brattle Report notes that GSI was not a going concern on November 30, 2017 and may have ceased to be a going concern years prior to this date. The Brattle Report also notes that the net book value of GSI at November 30, 2017 was negative, meaning that upon a liquidation, the assets on GSI's books would not yield sufficient funds to fully extinguish its liabilities. GSI's books, however, do not include the asset value associated with its seismic database. As the Brattle Report points out, to the extent that the value of GSI's seismic database exceeded its [redacted] on November 30, 2017, the actual value of GSI's equity at November 30, 2017 would not be nil, contrary to the assumption used in the Initial PwC Report.

162. The Brattle Report does not, however, quantify the value of GSI's seismic database or of GSI at November 30, 2017 but instead argues for the possibility that the value was not nil. Based on our understanding of the state of the seismic data, its age, and most importantly, the fact that the data was generally available for copy from Canadian governmental agencies, we believe that it is unlikely that GSI's seismic database had any material value at November 30, 2017.

163. The Brattle Report also argues that "there may have been value in GSI's contemporaneous and future lawsuits against its customers, but this is speculative."[109] We agree with the Brattle Report's assertion that a quantification of GSI's lawsuits would be speculative; it is inherently so as it is a legal determination to be made by the relevant courts. We do not believe that it would be appropriate to quantify the value of such as the outcome of such litigation is a legal question and not within the jurisdiction of this arbitration. Simply put, as financial experts, we do not have the requisite legal expertise to independently quantify the value of these claims.

164. Given the lack of value associated with the seismic database on November 30, 2017 and the speculative nature of a quantification of GSI's claims, we believe that the assumption that GSI's actual value at November 30, 2017 was nil is reasonable.

Shareholder Loans

165. With respect to our quantification of losses on shareholder loans and loans from the shareholder of an affiliate, the Brattle Report notes that our analysis does not consider an analysis on the terms of the shareholder loans[110].

166. We understand that with respect to these loans, no formal repayment terms exist with respect to the quantum and timing of repayments and we relied on representations regarding the loans' outstanding balance and interest amounts. Based on this information, we have taken the approach that the loss on the loan based on the quantum of exposed outstanding principal (and interest for the quantification of the loss at June 30, 2022).

[109] Brattle Report, Paragraph 203
[110] Brattle Report, Paragraph 206

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167. Furthermore, it is our understanding that the loans are akin to equity in that they were established in order to inject owner-executive bonuses, which had been paid as a tax minimization strategy, back into the business. The value of such loans depends on GSI's ability to repay the loans, which, in turn, is driven in large part by the underlying enterprise value of GSI.

168. The Brattle Report also notes that as of November 30, 2017, GSI had a "total cash balance of [redacted][111] The Brattle Report notes that "[redacted][112]

169. First, we note that of the related-party loans balance of $5.9 million, approximately $694,000 relates to a debt owed to individuals other than Messrs. Einarsson. In other words, this amount is not part of the quantification of losses from shareholder loans and shareholder of affiliate loans. Deducting these other related-party loans from the cash balance of [redacted] as well as approximately $[redacted] in accounts payable, leaves [redacted] potentially available for the repayment of shareholder loans.

170. Additionally, we note that GSI had been involved in litigation on multiple fronts and had been incurring legal fees. We understand that GSI had been incurring legal or other professional fees that had either not been fully accrued or were foreseen. Accordingly, we understand that these funds had been earmarked for the payment of these obligations.

Damages from Lost Employment Earnings

171. With respect to our quantification of lost employment earnings, the Brattle Report notes that GSI would not have had the ability to pay these wages[113]. We agree that in reality, GSI in fact would not have been able to (and did not) pay the wages of Mr. Paul Einarsson, Mr. Russell Einarsson, and Mr. Davey Einarsson. However, in the But-for Scenario, which reverses the impacts stemming from the alleged breach, GSI would have been able to pay these compensation amounts.

172. The Brattle Report also raises the impact of potential mitigation[114]. We note that as a result of the alleged breaches, GSI became involved in legal disputes with many of its customers and as a result suffered reputational harm in the oil and gas industry. We understand that it is not likely that any of the three Einarssons would have had the ability to obtain gainful employment in the industry providing services that reflect their core competencies, experience, and expertise: leading efforts to obtain and ultimately license Canadian offshore seismic data.

[111] Brattle Report, Paragraph 207
[112] Brattle Report, Paragraph 207
[113] Brattle Report, Paragraph 210
[114] Brattle Report, Paragraph 211

173. The Brattle Report also correctly points out that we used a date of April 18, 2016. We understand that this date is relevant as it marks three years prior to the filing of the Notice of Arbitration[115].

174. Next, the Brattle Report notes that the assumed retirement dates used in the Initial PwC Report were "speculative"[116]. With respect to Mr. Davey Einarsson, we understand that he was actually involved in GSI's minimal operations until 2019, hence the underlying rationale for using 2019 as the end date for this calculation. With respect to Mr. Paul Einarsson and Mr. Russell Einarsson, the assumed retirement ages of 75 years reflects input from the individuals themselves. In our experience as business valuators, a retirement age of 75 years old is not unreasonable for a closely-held private corporation.

175. Finally, the Brattle Report argues that the selected discount rate of 5.0% "fails to capture risks"[117] associated with GSI's future failure. It is PwC's view that the overall riskiness of the Einarssons maintaining employment throughout the forecast period is low in the But-for Scenario. We understand that the three individuals each possess unique knowledge regarding the landscape of Canadian offshore data and data exploration and in the event of GSI's failure, would have been able to obtain gainful employment in similar roles at another enterprise engaging in similar services.

Accrued Interest on November 30, 2017 Losses

176. In the Initial PwC Report, we calculated interest accruing on losses at November 30, 2017 using two interest rates, a 20-year risk free rate[118] and a 20-year BBB Canadian corporate bond yield. The Brattle Report asserts that the appropriate rate is a risk-free debt rate as this rate "will compensate the Claimants on the same commercial basis as Canada's other creditors"[119] and the relevant risk-free rate to use is a short-term rate because this rate "isolates the Claimants from bearing the risk of unanticipated changes in interest rates."[120]

[115] Given the ancillary effects of the Decisions, we understand that the employment earnings could have included more time prior to the three years preceding the filing of the Notice of Arbitration.
[116] Brattle Report, Paragraph 213
[117] Brattle Report, Paragraph 214
[118] 20-year Canadian Sovereign Strip yields in each year
[119] Brattle report, Paragraph 219
[120] Brattle report, Paragraph 219

177. We are not aware of any particular mandated or prescribed interest rate to be applied in NAFTA cases or international investor state disputes. However, we understand that past awards against the Government of Canada have not necessarily reflected risk-free rates. We note that in Mobil Investments Canada Inc. and Murphy Oil Corporation v. Canada, prejudgment interest was awarded at a rate of 12-month Canadian dollar LIBOR[121] + 4%. In this case, LIBOR is a rate paid by banks when borrowing funds from other banks. To this rate, a spread of four percentage points was added resulting in a total rate that is clearly not a risk-free rate. In fact, a similar rate build-up (i.e., a 12-month Canadian dollar offered rate[122] plus a spread of 4%) would results in rates that exceed BBB-rated bonds, as noted in the table below:

Rate type	2017	2018	2019	2020	2021	2022
CDOR + 4%	5.09%	5.86%	5.80%	4.62%	4.35%	6.85%
Canadian 20-year BBB Corporate	4.37%	4.52%	4.05%	3.58%	3.82%	4.91%
Canadian 20-year Sovereign Strips (i.e., risk-free)	2.35%	2.50%	1.98%	1.25%	1.87%	2.74%

178. The Initial PwC Report presents interest calculated using two interest rates; two rates are presented in order to provide an illustrative range with a risk-free rate at the low end and higher corporate debt yield used on the high end. These rates are provided for illustrative purposes and PwC does not hold a view in terms of the correct rate to be applied. In any case, a short-term risk free rate, as suggested in the Brattle Report, does not appear to be supported by past NAFTA judgments.

PwC's Comments in Response to The Hobbs Report

179. The Hobbs Report asserts that "if GSI had continued to invest in its library until the valuation dates, then revenues are likely to be overestimated by 2 times."[123] The Hobbs Report does not provide any quantitative basis or analysis for their view that "revenues are likely to be overstated by 2 times"; in fact, this view appears to be complete speculation.

[121] London Inter-bank Offered Rate
[122] For the 2017 to 2022 period, the Canadian dollar equivalent to LIBOR was CDOR, or the Canadian Dollar Offered Rate.
[123] Hobbs Report, Paragraph 97

180. With respect to our normalization of revenues for disclosed data, the Hobbs Report questions the use of a 2x multiplier for instances where data has been accessed by oil and gas exploration and production companies. As per the Hobbs Report, "standard [master license agreements] in the [multi-client] industry provide for a client (or licensee) to own a license to use the data as they see fit. Only they can use the data under the license, however they are free to use it for their work as necessary. If the licensee enters into a partnership, provided that the other partners already have a license to the data or do not want access to the data, then the licensee does not have to buy another license. If the other partners want to use the data, they will have to buy their own licenses. Likewise, if an M&A transaction occurs, there is typically a discounted price (as defined in the provisions for transfer fees in the [master license agreement]) that the acquiring company must pay if they wish to continue to utilize the data. Both of these events do not involve the licensee (or client in Sharp's description) to buy another license."[124]

181. The Hobbs Report presents an assumption that GSI's contractual arrangements with its clients follow what is characterized in the Hobbs Report as standard license agreements. It is our understanding that GSI's standard contractual arrangements with its customers included provisions requiring fees to be paid upon certain events such as a requirement for all partners in a joint exploration area to pay equalization payments and transfer fees in the case of a change in ownership. The Gill Report notes that:

"[Exploration and production company acquisitions and mergers change the future assumptions in the financial models which were used to create the fee structure by diminishing the pool of prospective licensees and thus eliminating the possibility of those future licensing events. A contractual mechanism in standard data-use license agreements was developed to address this risk and requires the payment of transfer fees in the event of a merger or an acquisition. These fees are designed to mitigate the financial exposure of the data owner, and provide the acquiring [exploration and production] company an opportunity to license the non-exclusive data under very favourable pricing terms. This contractual mechanism is fundamental to the successful economics of the non-exclusive business."[125]

[124] Hobbs Report, Paragraph 100
[125] Gill Report, Paragraph 52

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182. Next, the Hobbs Report questioned the use of a 3.0x multiplier to be applied in instances where GSI's data had been accessed by other seismic data contractors and data copy companies. The Hobbs Report asks: "why would a customer pay for this "repackaged" information if they can obtain the data for free from the government, themselves?"[126] First and most importantly, we note that in the But-for Scenario, this data would not have been available, which renders the Hobbs Report's argument moot. Additionally, it is our understanding that seismic data providers would have the equipment and software available to enhance and improve the disclosed data; these enhancements would make the data more marketable to oil and gas companies.

183. Secondly, we understand that there exists copy companies that have the capabilities to scan and vectorize data for resale purposes. It is our understanding that the 3.0x multiplier is intended to capture this.

184. Furthermore, and more importantly, part of the alleged breach includes the performance requirement to provide proprietary information to third parties. Simply put, in the But-for Scenario, GSI was not required to transfer its proprietary information in the first place.

185. Similarly, the Hobbs Report notes the impact of competition and the fact that companies in the oil and gas industry would have chosen better, denser data[127]. We understand that at the time of the commencement of the Litigation Period, GSI had the largest database of seismic data available for offshore Canada and significant market share for the licensing of data in this area. In a But-for Scenario, where the alleged expropriation does not occur, it is our understanding that GSI would have had the ability to maintain this market share through continued data acquisition and through the refinement and enhancement of its existing portfolio of data. The Hobbs Report points out that there is actual data that existed that was superior to GSI's data at the Valuation Dates. With respect to a But-for valuation, this point is not relevant.

Status of Initial PwC Report Conclusions

186. Upon review of the comments in the Brattle Report and the Hobbs Report, we do not believe that any adjustments to the Initial PwC Report's conclusions would be appropriate.

[126] Hobbs Report, Paragraph 101
[127] Hobbs Report, Section IV.B

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Stikeman Elliott LLP
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Report Authorship

187. This expert report was prepared by Paul W. Sharp, CPA, CA, CBV and others under his supervision.

Yours very truly,

PricewaterhouseCoopers LLP

Paul W. Sharp, CPA, CA, CBV
Partner, Deals

Appendix A
Restrictions and Qualifications

A.1 Appendix A forms an integral part of and must be read in conjunction with our report. In particular, detailed discussion with respect to assignment background, limiting conditions, assumptions and representations, which are integral to our analyses, are contained within the report.

Restrictions and Qualifications

A.2 This PwC Reply Report is not to be used for any purpose other than that stated and it is not intended for general circulation, nor is it to be published or made available to other parties in whole, or in part, without our prior written consent. We do not accept responsibility for any losses arising from the unauthorized or improper use of the PwC Reply Report.

A.3 As a limited critique report, as defined by the Canadian Institute of Chartered Business Valuators, the PwC Reply Report does not contain a conclusion as to the quantum of loss and does not contain all the adjustments, if any, that we may have found necessary to arrive at a conclusion on quantum of loss.

A.4 We have relied upon the completeness, accuracy and fair presentation of all the financial information, operational data, advice, opinions or representations obtained from public sources (collectively, the “Information”), which is detailed under the Scope of Our Review section. We have not conducted any further audit or review of the information provided, nor have we sought external verification of the information provided to us.

A.5 Readers are cautioned that selecting portions of the analysis contained herein, without considering all factors and analysis in this report together could result in a misinterpretation of our analysis and comments. The preparation of our analysis is a complex process and components cannot be viewed in isolation.

A.6 We accept no responsibility or liability for any losses occasioned by any party as a result of our reliance on the financial and non-financial information that was provided to us or that we have obtained from third parties.

A.7 We reserve the right (but will be under no obligation) to make revisions to this report should we be made aware of facts existing at the date of this report, which were not known to us when we prepared this report.

A.8 Nothing contained herein is to be construed as a legal interpretation or an opinion on any contract or document.

A.9 The individuals that prepared the report did so to the best of their knowledge, acting independently and objectively.

A.10 PwC's compensation is not contingent on an action or event resulting from the use of the report.

A.11 This report has been prepared in conformity with the Practice Standards of the Canadian Institute of Chartered Business Valuators.

Appendix B

Scope of Review

B.1 Appendix B forms an integral part of and must be read in conjunction with our report. In particular, detailed discussion with respect to assignment background, limiting conditions, assumptions and representations, which are integral to our analyses, are contained within the report.

Scope of Review

B.2 In preparing the PwC Reply Report, we reviewed and relied on the following:

a. The Brattle Report (RER-04);

b. The Hobbs Report (RER-02);

c. The Gill Report (CER-03);

d. The Initial PwC Report, including any relevant documents referenced therein (CER-02);

e. The Claimants' Memorial;

f. [redacted] (C-356);

g. [redacted] (C-357);

h. Canada Valuation Service, 2010 Student Edition (C-358);

i. The Valuation of Business Interests (C-359);

j. Mobil Investments Canada Inc. and Murphy Oil Corporation v. Canada (C-360);

k. GSI's debt agreements for loans dated between January 2006 and September 2009 (C-361);

l. "The Use of Econometric and Statistical Analysis in Damages", Jennifer Vaderhart, Steven Schwartz, and Richard Brady; published in the Global Arbitration Review (C-362);

m. ICSID Case No. ARB/20/46; First Quantum Expert Report of Isabel Santos Kunsman and Alexander Lee dated March 24, 2022 (C-363);

n. Historical EBITDA margin information for Pulse Seismic and TGS (C-364);

o. Public market debt information regarding yield curves (C-365); and

p. Discussions with Mr. Paul Einarsson and, as described, instructions from Counsel.

Appendix C
Major Assumptions

C.1 Appendix C forms an integral part of and must be read in conjunction with the PwC Reply Report. In particular, detailed discussion with respect to assignment background, limiting conditions, assumptions and representations, which are integral to our analyses, are contained within the report.

Major Assumptions

C.2 In preparing the PwC Reply Report, we made the following assumptions (in addition to those set our throughout the PwC Reply Report, including its Appendices and Schedules):

a. All the information contained in the Background section and other instances throughout this Reply Report where we have indicated our understanding of certain representations are true and factual; and

b. All of the information listed in Appendix B is accurate and appropriate for use in this PwC Reply Report.

C.3 Amendment of any of these assumptions could materially impact our conclusion.

Appendix D

Glossary of Key Terms and Abbreviations

D.1 Appendix E forms an integral part of and must be read in conjunction with this report. In particular, detailed discussion with respect to assignment background, limiting conditions, assumptions and representations, which are integral to our analyses, are contained within the report.

Glossary of Key Terms and Abbreviations

Reference	Description
Board Data	Data provided by the Government of Canada detailing instances of the Dislcosures accessed by third parties
Brattle Report	Expert report prepared by the Brattle Group dated January 16, 2023
But-for Scenario	A scenario wherein certain actions on the part of the Government of Canada (i.e., the alleged breaches) did not occur
CCF	Capitalized cash flow
CICBV	Canadian Institute of Chartered Business Valuators
Claimants	Mr. Theodore David Einarsson, Mr. Harold Paul Einarsson, and Mr. Russell John Einarsson
Counsel	Stikeman Elliott LLP
DCF	Discounted cash flow
Decisions	Certain Canadian court decisions. Specifically, 2016 AB QB 230, 2017 ABCA 125, and 2017 SCC 37634.
Direct Expense Reference Period	Period encompassing the years ended December 31, 2000 to December 31, 2008
Disclosures	Certain non-exclusive data (shot within Canada and was required to be submitted to Canadian governmental agencies) that was disclosed to and copies by third parties
EBITDA	Earnings before interest, taxes, depreciation, and amortization
G&A	General and administrative expenses
G&A Reference Period	Period encompassing the years ended December 31, 2006 to December 31, 2008
Gill Report	Expert Report of Mr. "Chip" Gordon C. Gill dated September 13, 2022
GSI	Geophysical Service Inc.

Hobbs Report	Expert report prepared by Mr. Robert Hobbs dated January 14, 2023
Initial PwC Report	Our September 26, 2022 expert report
Litigation Period	Period of litigation leading to the Decisions, which occurred between 2007 and 2017
NAFTA	North American Free Trade Agreement
Normalization Period	Period encompassing the years ended December 31, 2000 to December 31, 2012
Original GSI	GSI's predecessor
Preceding Company	GSI's predecessor
PwC	PricewaterhouseCoopers LLP ("PricewaterhouseCoopers", "we", "us")
PwC Reply Report	Reply report in response to the Brattle Report and the Hobbs Report
Respondent	The Government of Canada
Stikeman Elliott	Stikeman Elliott LLP
Unpaid Invoices	Certain invoices containing licensing charges to customers of GSI that have not been paid
Valuation Dates	November 30, 2017 and June 30, 2022
WACC	Weighted Average Cost of Capital
$	Canadian dollars