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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BAKER HUGHES INCORPORATED,
Petitioner,

v.

LIQUIDPOWER SPECIALTY PRODUCTS INC.
(f/k/a LUBRIZOL SPECIALTY PRODUCTS, INC.)
Patent Owner.

Case IPR2016-01896
U.S. Patent No. 8,022,118

**LIQUIDPOWER SPECIALTY PRODUCTS, INC.'S PRELIMINARY
RESPONSE TO PETITION FOR *INTER PARTES* REVIEW OF U.S.
PATENT NO. 8,022,118 PURSUANT TO 37 CFR § 42.107**

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PATENT OWNER'S EXHIBIT LIST

EXHIBIT	DESCRIPTION
2001	Complaint by Lubrizol Specialty Products, Inc. against Petitioner (Docket No. 1) from <i>Lubrizol Specialty Products, Inc. v. Baker Hughes Incorporated</i> , No. 4:15-cv-02915 (S.D. Tex. October 5, 2015)
2002	Complaint and Summons served upon Petitioner on October 7, 2015 (Docket No. 15) from <i>Lubrizol Specialty Products, Inc. v. Baker Hughes Incorporated</i> , No. 4:15-cv-02915 (S.D. Tex. October 5, 2015)
2003	Lubrizol Specialty Products, Inc.'s Preliminary Patent Owner's Response to Petition for <i>Inter Partes</i> Review of U.S. Patent No. 8,022,118 Pursuant to 37 CFR § 42.107 from IPR2016-00734 filed on July 6, 2016
2004	Institution Decision from IPR2016-00734 filed on October 4, 2016
2005	Information Disclosure Statement (IDS) from the Prosecution History signed by Richard Yuen on April 8, 2010
2006	R.W. Veatch, Jr., SPE, <i>Overview of Current Hydraulic Fracturing Design and Treatment Technology—Part 2</i> , Journal of Petroleum Technology (May 1983), pp. 853-864
2007	Office Action from the Prosecution History for U.S. Patent No. 8,022,118 (October 21, 2009)
2008	Office Action from the Prosecution History for U.S. Patent No. 8,022,118 (June 15, 2010)
2009	The Merck Index, An Encyclopedia of Chemicals, Drugs, and Biologicals, Eleventh Edition (1989), p. 834, p. 1590
2010	Number Reserved
2011	E-mail dated February 24, 2016 from Petitioner's District Court Litigation Counsel producing documents bates numbered

	BH000001-BH011247
2012	U.S. Patent 3,758,406 produced by Petitioner's District Court Litigation Counsel at BH003410- BH003416
2013	European Patent Application EP 0 882 739 A2 produced by Petitioner's District Court Litigation Counsel at BH010240-BH010258
2014	E-mail dated July 11, 2016 from Petitioner's District Court Litigation Counsel attaching a draft of Petitioner's Supplemental Invalidity Contentions
2015	E-mail dated July 19, 2016 from Petitioner's District Court Litigation Counsel serving Petitioner's Supplemental Invalidity Contentions
2016	Memorandum and Order on Claim Construction filed on December 8, 2016 (Docket No. 127) from <i>Lubrizol Specialty Products, Inc. v. Baker Hughes Incorporated</i> , No. 4:15-cv-02915
2017	P. Juyal, et al., <i>Effect of Crude Oil Aging on Asphaltene Inhibitor Product Recommendation</i> , 32 J. Dispersion Science and Tech. 1096 (2011)
2018	A. Saniere, et al., <i>Pipeline Transportation of Heavy Oils, a Strategic, Economic and Technological Challenge</i> , Oil & Gas Science and Technology – Rev. IFP, Vol. 59 (2004), No. 5, pp. 455-466
2019	L. Rosson, <i>Enhancing flow for Canadian crudes</i> , EPmag.com (Nov. 2014)
2020	CARBO – Ceramic Proppant found at: http://www.carboceramics.com/products-and-services/fracture-technologies/ceramic-proppant
2021	Excerpts from the deposition transcript of John C. Fetzer, Ph.D. (Sept. 7, 2016)
2022	Excerpts from the deposition transcript of Thomas H. Epps, III

	(Nov. 30, 2016)
2023	Entry of Petroleum Refining from the Britannica Online Encyclopedia found at: https://www.britannica.com/print/article/454440
2024	Number Reserved
2025	Response to Final Office Action from the Prosecution History for U.S. Patent No. 8,022,118 (August 27, 2009)
2026	Exhibit 1005, Declaration of Professor Thomas H. Epps, III, from IPR2016-00734
2027	Petition for <i>Inter Partes</i> Review from IPR2016-00734
2028	Excerpt from presentation produced by Petitioner from Lubrizol Specialty Products, Inc. v. Baker Hughes Incorporated, No. 4:15-cv-02915 bates labeled BH013806
2029	E-Mail dated November 21, 2016 from Petitioner's District Court litigation counsel to LSPI's District Court litigation counsel de-designating BH013806
2030	Number Reserved
2031	Number Reserved
2032	Number Reserved
2033	Number Reserved
2034	Number Reserved
2035	B. Gunter, <i>Overcoming the Barriers to Commercial CO₂ – EOR for Alberta, Canada</i> (2013)
2036	M. Bobra, <i>A Catalogue of Crude Oil & Oil Product Properties</i> (1990)

I. Introduction

The Petitioner has already filed, and the Board has already instituted, an IPR (IPR2016-00734) on the exact same patent claims that are at issue in this Petition. The Board should exercise its discretion to deny Petitioner's latest request for *Inter Partes* Review ("IPR") of U.S. Patent No. 8,022,118 ("118 Patent") for three reasons. First, this Petition is based on prior art that was squarely considered and rejected by the Patent and Trademark Office ("PTO") in the original prosecution of the 118 Patent. Petitioner has provided no explanation for why it did not include this prior art in its original Petition or why its arguments in this second Petition are any different from what the Examiner has already considered during the original prosecution of the 118 Patent. Moreover, the Petitioner also re-uses prior art that it included in the first Petition and which the PTO is already considering in that case. Second, this "follow-on" Petition was strategically filed over six months after the first Petition—which unfairly allowed Petitioner to study both the Patent Owner's Preliminary Response ("POPR") and the Board's institution decision and then change its positions in this second Petition based on that review. The Board has previously denied institution in these circumstances as a matter of policy to prevent this type of tactical gamesmanship and should do the same here. Third, this Petition is redundant because it covers the exact same claims on which the Board has already instituted an IPR (IPR2016-00734) months ago and would be a waste

of both the Board's and the parties' resources because it will become moot after the Board issues a final written opinion in the earlier IPR. Ultimately, a final decision in the first IPR will result in cancellation or create an estoppel against Petitioner on each claim in the 118 Patent. There is no need to institute a "follow-on" Petition on the same patent claims. Thus, the Board should exercise its discretion and deny institution.

The Board should also deny the Petition because it does not adequately specify the grounds and disclosures in the prior art on which it rests. A Petition must identify specific portions of the evidence that supports its challenge. The Petition fails to provide citations to the prior art for each and every element of the claims, both for anticipation and obviousness. Thus, the Board should deny the Petition for this independent reason.

Finally, should the Board reach the merits of the Petition, the Board should deny the Petition for multiple reasons. First, Petitioner does not identify a single reference in either of its two combinations that discloses the claimed step of drag reducing a heavy, asphaltenic liquid hydrocarbon. Petitioner's conclusory, generic assertion that a Person of Ordinary Skill in the Art ("POSA") would modify these references to include this crucial limitation is divorced from the prior art references and the knowledge of a POSA at the time of the invention. Second, Petitioner's obviousness analysis is impermissibly based on hindsight reconstruction.

Petitioner cites nothing to suggest that a POSA would have focused on asphaltene content for drag reduction of a liquid hydrocarbon prior to the invention in the 118 Patent. Third, both of the Holtmyer references, which Petitioner relies on in both Grounds 1 and 2, involve drag reduction of hydraulic fracturing fluids, which teaches away from the claimed heavy, asphaltenic liquid hydrocarbon. Finally, the Holtmyer Publication does not disclose the claimed range for the introduction of the drag reducing polymer—a limitation that was added to distinguish prior art and addressed in the Notice of Allowance.

II. Background

A. Petitioner Has Filed Serial IPR Petitions In Response To Patent Owner's Preliminary Response And The Board's Institution Decision

LiquidPower Specialty Products Inc. (“LSPI”)¹ sued Petitioner on October 5, 2015 for infringement of the 118 Patent and three related patents, all of which share the same specification and all of which claim methods of drag reduction in heavy, asphaltenic liquid hydrocarbons. Ex. 2001 [Complaint]. Petitioner was served on October 7, 2015. Ex. 2002 [Summons].

¹ The name of Lubrizol Specialty Products, Inc. has changed to LiquidPower Specialty Products Inc.

In response, Petitioner filed an IPR petition (IPR2016-00734) on April 1, 2016 on only one of those four patents, arguing that all claims of the 118 Patent should be cancelled. It argued that claims 1, 3, 4, 6, 7, and 11 were anticipated by U.S. Patent No. 6,015,779 (“Eaton”), which is directed to a traditional polyalphaolefin drag reducing agent, and that claims 1-7 and 11 were obvious over Eaton in view of Strausz et al., *The Chemistry of Alberta Oil Sands, Bitumens and Heavy Oils* (“Strausz”), which is referenced in the specification of the 118 Patent. Petitioner also argued that claims 8-10, all of which require that the drag reducing polymer include a heteroatom, are obvious over Eaton in view of Strausz and U.S. Patent No. 4,983,186 (“Naiman”), a patent that Petitioner has owned since 1997 and is cited on the face of the 118 Patent.

LSPI filed its POPR for the first Petition on July 6, 2016. Ex. 2003 [POPR]. The Board issued its institution decision on Petitioner’s first IPR on October 4, 2016, which instituted the IPR as to all claims in the 118 Patent on all requested grounds. Ex. 2004 [Institution Decision]. Two days later, on October 6, 2016, Petitioner filed new IPR Petitions on each of the four, related patents asserted in the litigation—including a duplicative second Petition on the 118 Patent that covers the exact same claims as the first instituted Petition—one day before the twelve month bar date of October 7, 2016. *See* 35 U.S.C. § 315.

B. The References Cited In The Petition Do Not Adequately Support Petitioner's Challenge

The Petition includes two Grounds, which separately contend that every claim in the 118 Patent is obvious based on the following references:

1. Ex. 1005, "Study of Oil Soluble Polymers as Drag Reducers," ("Holtmyer Publication") (primary reference cited in Ground 1).
2. Ex. 1006, U.S. Patent No. 3,758,406 ("Holtmyer Patent") (secondary reference cited in Ground 1).
3. Ex. 1007, European Patent Application No. EP 0,882,739 ("Inaoka") (primary reference cited in Ground 2).
4. Ex. 1009, *The Chemistry of Alberta Oil Sands, Bitumens and Heavy Oils*, Alberta Research Institute, Calgary (2003) ("Strausz") (secondary reference cited in both Grounds 1 and 2).

A brief summary of the references relied upon in the Petition is provided as support for LSPI's position that the obviousness Grounds presented in the Petition are unsustainable.

1. Holtmyer Publication And Holtmyer Patent

The Holtmyer Patent was disclosed to the PTO during the prosecution of the 118 Patent by the Applicant. Ex. 2005 [IDS]. The Holtmyer Publication is merely cumulative of the Holtmyer Patent that was previously considered by the PTO. As Petitioner acknowledges, "[t]he Holtmyer Patent describes much of the same

subject matter as the Holtmyer Publication.” Pet. at 17. Petitioner’s expert likewise states that “a patent obtained by Holtmyer describe[s] largely the same subject matter” as the Holtmyer Publication. Ex. 1041 ¶ 95. Notably, both of the authors of the Holtmyer Publication are inventors on the Holtmyer Patent.

The Holtmyer Publication and Holtmyer Patent, which were published in 1980 and 1973, respectively, are both focused on drag reducers for hydrocarbon fracturing fluids that are introduced into formations to achieve hydraulic fracturing. For example, the Holtmyer Publication states:

Often times hydraulic fracturing is used to stimulate oil and gas wells **where a hydrocarbon fluid is used as the fracturing fluid**. It is necessary that these fluids be pumped at high rates, under high shear conditions, with minimum pumping pressure loss to fracture hydrocarbon bearing rock formations. **Drag reducers for hydrocarbon fluids** have been used for years to meet these requirements; however, they were often less effective than desired.

Ex. 1005 at 474. Likewise, the Holtmyer Patent states:

In addition, in the hydraulic fracturing of subterranean well formations, **hydrocarbon fracturing fluids** such as kerosene or crude oil with and without propping agents suspended therein are commonly pumped through long strings of tubing or pipe at high velocities in order to cause fracturing of the formations.

Ex. 1006 at 1:50-55; *see also id.* at 6:33-53.

In hydraulic fracturing, the “fracking fluid” is injected into the well and the “propping agents,” such as sand or ceramics, keep open the fissures created during the fracking process. Ex. 2006 [*Overview of Current Hydraulic Fracturing Design and Treatment Technology*] at 859 (“The function of a propping agent (proppant) is to hold the fracture open after the hydraulic treatment has been completed. The reservoir fluids then can flow through the conductive path created by the proppant pack in the fracture. Silica sand is by far the most commonly used proppant in the U.S. today.”). The Holtmyer Patent refers to these “propping agents” suspended in the fracking fluid as sand or other solid agents. Ex. 1006 at 1:50-55. The Holtmyer Patent further states that “the polymer additive” can be “used with a well-treating fluid containing sand or other solid agent suspended therein.” Ex. 1006 at 4:64-65.

The Holtmyer references do not disclose or suggest any drag reduction of a heavy, asphaltenic liquid hydrocarbon. Instead, the only particular tests of fluids that are disclosed relate to processed solvents (*e.g.*, kerosene, and QC-1156) and light crude (*e.g.*, Cardium and Ellenberger). *See, e.g.*, Ex. 1006, Table V; Ex.1005, Table 9; Ex. 2035 [*Overcoming the Barriers to Commercial CO₂ – EOR for Alberta, Canada*] (Cardium has an API gravity of 38°); Ex. 2036 [*A Catalogue of Crude Oil & Oil Product Properties*] (Ellenberger has an API gravity of 47.6°). The only allegedly low-API gravity hydrocarbon disclosed in the Holtmyer

references is “QC-1156,” which is “primarily an aromatic hydrocarbon with an API gravity of 22.5° and a boiling point in the range of 395-500°F.” Ex. 1006, Table V; Ex. 1005, Table 9. Petitioner does not contend that QC-1156 contains any asphaltene content, much less an asphaltene content of “at least 3 weight percent” as required by every claim in the 118 Patent. And QC-1156, in fact, has no asphaltene content because it is a processed solvent that is obtained by fractionating it from crude oil.² Neither of the Holtmyer references mention or teach anything about asphaltenes.

The Holtmyer references disclose an iDMA drag reducing polymer. The iDMA drag reducing polymer is only tested in closed loop laboratory devices, not

² Solvents derived from petroleum refining must, by definition, contain no asphaltene. Petroleum refining involves boiling and condensing various fractions of the crude oil. Ex. 2023 [Encyclopaedia Britannica]. Strausz states that asphaltene is a “friable, amorphous, thermolabile, dark solid which, upon heating, decomposes with intumescence without a sharp melting point, while giving off first water vapor and then gases and other vapors.” Ex. 1009 at 459. In other words, asphaltenes will decompose, not boil. QC-1156 has a defined boiling point range of 395-500°, which confirms that it has no asphaltene content.

in a pipeline. Ex. 1006 at 7:46-65; Ex. 1005 at 474. Notably, the iDMA testing in QC-1156 was performed only at a concentration of 600 ppm, which is outside of the claimed range of “from about 0.1 to about 500 ppmw” that is required by all claims in the 118 Patent. Ex. 1006, Table V; Ex. 1005, Table 9.

2. Inaoka

The Inaoka reference was extensively considered by the Examiner during prosecution of the 118 Patent. Inaoka was explicitly discussed by the Examiner in the October 21, 2009 Office Action (Ex. 2007 at 4-9), the June 15, 2010 Office Action (Ex. 2008 at 6-7), the November 18, 2010 Office Action (Ex. 1024 at 3-11), and the Notice of Allowance (Ex. 1026 at 4-5). Inaoka mentions that its drag reducing polymer could be used in “crude oil,” but it does not disclose or suggest drag reducing a heavy, asphaltenic liquid hydrocarbon as claimed in the 118 Patent. In fact, Inaoka focuses on kerosene and xylene, which are relatively light solvents that are materially different than a heavy, asphaltenic liquid hydrocarbon. Ex. 1007 at 8; Ex. 1026 at 10.

Inaoka is primarily directed at a method of synthesizing a “high molecular weight polymer” and therefore focuses on limitations relating to optimizing a free radical polymerization reaction. Inaoka briefly discusses using the “high molecular weight polymer” produced by its claimed process as a drag reducer in a crude oil, either by itself or in combination with a “known adduct which is used in

a common drag reducer.” Ex. 1007 at 8:16-17. The “high molecular weight polymer” is only tested in kerosene (with an API gravity of about 45°) and xylene (with an API gravity of about 33°), and only in a capillary tube under laboratory conditions. *Id.* at 14:26-28; Ex. 2009 [Merck Index] at 834 (Kerosene with a specific gravity of “about .80”), 1590 (Xylene with a specific gravity of “about .86”).³ Neither kerosene nor xylene has any asphaltene content.⁴ Inaoka does not use its polymer in any fluids other than kerosene or xylene, and does not use its polymer in a pipeline.

3. Strausz

Strausz is an excerpt from a text that discusses a solubility study on asphaltenes, and it was cited in the specification of the 118 Patent. Ex. 1009; Ex. 1001 at 4:31-33. Strausz does not disclose or suggest drag reduction or drag reducing polymers. Contrary to Petitioner’s argument, there is no indication that a POSA would have been aware of Strausz or would have attempted to use it to

³ The API gravity can be calculated from the specific gravity, namely API gravity = (141.5 / specific gravity) – 131.5. Ex. 1001 at 3:64-4:2.

⁴ Their lack of asphaltene is evidenced by their boiling points. Ex. 2009 at 834 (Kerosene has a boiling range between 175°C and 325°C), 1590 (Xylene has a boiling range between 137°C and 140°C).

solve drag reduction problems. Petitioner's use of Strausz for obviousness is based purely on hindsight gleaned from the inventors' own contributions in the 118 Patent.

III. The Board Should Exercise Its Discretion And Deny Institution Of The Petition

This is a "follow on" Petition that challenges the exact same claims of the 118 Patent that are already at issue in an instituted IPR. Serial challenges to the same patent by the same challenger are disfavored because, among other things, such challenges "risk[] harassment of patent owners and frustration of Congress's intent in enacting the Leahy-Smith America Invents Act." *Butamax Advanced Biofuels v. Gevo, Inc.*, IPR No. 2014-00581, Paper No. 8 at 13 (PTAB Oct. 14, 2014). The legislative history of the AIA stressed that IPR and CBM proceedings "are not to be used as tools for harassment . . . through repeated litigation and administrative attacks on the validity of a patent. Doing so would frustrate the purpose of the section as providing quick and cost effective alternatives to litigation." H.R. Rep. No. 112-98, pt.1, at *48 (2011). To guard against these tactics, Congress gave the Board discretion to deny serial petitions. *See* 35 U.S.C. §§ 314(a) and 325(d); 37 C.F.R. § 42.108.

When considering whether to exercise its discretion to deny institution, the Board considers a non-exhaustive list of factors including, among others:

- (a) the finite resources of the Board;

- (b) the requirement under 35 U.S.C. § 316(a)(11) to issue a final determination not later than 1 year after the date on which the Director notices institution of review;
- (c) whether the same petitioner already previously filed a petition directed to the same claims of the same patent;
- (d) whether at the time of filing of the first petition, petitioner knew of the prior art asserted in the second petition or should have known about it;
- (e) whether at the time of filing of the second petition, petitioner already received patent owner's preliminary response to the first petition or received the Board's decision on whether to institute review in the first petition;
- (f) the length of time that elapsed between the time petitioner learned of the prior art asserted in the second petition and filing of the second petition;
- (g) whether petitioner provides adequate explanation for the time elapsed between the filings of multiple petitions directed to the same claims of the same patent.

See nVidia Corp. v. Samsung Elec. Co., IPR No. 2016-00134, Paper No. 9 at 6–7 (PTAB May 4, 2016) (internal citations omitted); *Great W. Cas. Co. v. Intellectual Ventures II LLC*, IPR No. 2016-00453, Paper No. 12 at 7–8 (PTAB June 9, 2016) (providing same factors). Moreover, in determining whether to deny institution, “the Director may take into account whether ... the same or substantially the same

prior art or arguments previously were presented to the Office.” 35 U.S.C. § 325(d). Here, as explained below, **all** of these factors strongly weigh in favor of the Board exercising its discretion under 35 U.S.C. §§ 314(a) and 325(d) and 37 C.F.R. § 42.108 to deny institution of this follow-on petition.

A. The Prior Art Has Already Been Considered By The PTO During The Original Prosecution Of The 118 Patent Or Is Being Considered In Petitioner’s First IPR

The Petition identifies two “Primary References”—the Holtmyer Publication and Inaoka—and the substance of each has already been considered by the PTO during prosecution of the 118 Patent. Petitions are routinely rejected where the same or substantially the same prior art was reviewed by the PTO during the original prosecution of the patent. *See Lower Drug Prices for Consumers, LLC v. Forest Labs. Holdings Ltd.*, IPR No. 2016-00379, Paper No. 14 at 9-12 (PTAB July 1, 2016) (denial affirmed Oct. 19, 2016) (denying institution under §325(d) where the examiner and the Board reviewed the same prior art and arguments during prosecution); *Graco Children’s Prods., Inc. v. Kolcraft Enters., Inc.*, IPR No. 2016-00810, Paper No. 8 at 10 (PTAB Sept. 28, 2016) (denying institution where during prosecution of the patent at issue and a related patent both examiners considered the same art raised in the petition).

Petitioner’s lengthy discussion of the prosecution history of the 118 Patent (Pet. at 7-10)—and indeed the entire Petition—omit that the Holtmyer Patent and

Inaoka have already been considered by the Examiner during the original prosecution of the 118 Patent. As described above, Inaoka was considered and discussed at length by the PTO in three separate Office Actions and the Notice of Allowance. Ex. 2007 at 4-9; Ex. 2008 at 6-7; Ex. 1024 at 3-11; Ex. 1026 at 4-5. In addition, the Holtmyer Patent was cited to the PTO in December 2006, when the 118 Patent was originally filed. Ex. 2005 at 4. Petitioner admits that the Holtmyer Patent “describes much of the same subject matter as the Holtmyer Publication.” Pet. at 17. In fact, the Holtmyer Publication is merely cumulative of the Holtmyer Patent, as the former focuses on the very same polymers and test results that were originally published in the Holtmyer Patent.⁵ Moreover, the fourth prior art reference, Strausz, (a repeat prior art reference from Petitioner’s first Petition) is explicitly discussed in the text of the specification of the 118 Patent (Ex. 1001 at 4:31-33) and was used by Petitioner in the first IPR for the exact same reasons it is used in this Petition. None of the substance of the prior art in this Petition is any different from what the Examiner already considered in the original prosecution

⁵ Both of the authors of the Holtmyer Publication are also inventors listed on the Holtmyer Patent.

when the 118 Patent was allowed or in the first IPR Petition which the Board is currently considering.

Moreover, Petitioner fails to describe why the prior art or its obviousness arguments are any different from what has already been considered and rejected by the PTO. *See, e.g., Baker Hughes Oilfield Operations, Inc. v. Smith Int'l Inc.* IPR No. 2016-01450, Paper No. 10 at 10-11 (PTAB Dec. 22, 2016) (denying Petition where prior art references were considered in the reexamination and original prosecution and “Petitioner makes no attempt to explain why the references that form the bases for Petitioner’s challenge here are not the same or substantially similar prior art to that presented during the reexamination or why the arguments are not the same or substantially similar to those presented previously to the Office”). Here, Petitioner “asserts substantially the same argument that the examiner asserted during prosecution.” *Lower Drug Prices for Consumers*, IPR No. 2016-00379, Paper No. 14 at 9.

For example, during prosecution of the 118 Patent, the Examiner repeatedly considered whether it would have been obvious to use the drag reducing polymer in Inaoka in a heavy, asphaltenic liquid hydrocarbon. *See, e.g.,* Ex. 1020 [June 24, 2009 Request for Reconsideration] (proposed claims); Ex. 2025 [August 27, 2009 Response]; Ex. 2007 at 7-9 (office action relying on Inaoka to initially reject pending claims that included a “liquid hydrocarbon having an asphaltene content

of at least about 3 weight percent and an API gravity of less than about 26°” as obvious before rejection was overcome). In a November 18, 2010 Office Action, the Examiner specifically discussed different types of crude oil, whether the heavy, asphaltenic liquid hydrocarbon was obvious in light of the disclosure in Inaoka, and rejected the pending claims. Ex. 1024 at 5. However, after considering the arguments, the Examiner withdrew the rejection and provided specific reasons in the Notice of Allowance for why the claims were distinguishable over Inaoka, as follows:

The claims are allowable because Inaoka does not teach the claimed liquid hydrocarbon having an asphaltene content of at least [sic] 3 wt% and an API gravity of less than 26°. Rather, Inaoka teaches **“crude oil” which has been established to be materially distinct from liquid hydrocarbon claimed.** The crude oil of Inaoka fall [sic] outside the scope of claim 1. **Furthermore, Inaoka does not provide any motivation to use the claimed liquid hydrocarbon, but rather teaches away by providing examples that use kerosene and xylene.**

Ex. 1026 at 4 (emphasis added). The Petition makes the exact same argument—namely that it would have been obvious to use the drag reducer in Inaoka in the claimed heavy, asphaltenic liquid hydrocarbon—which was squarely considered and rejected by the PTO during prosecution of the 118 Patent. Pet. at 37. In this Petition, Petitioner does not even argue that Inaoka must be combined with any

secondary reference for the addition of the claimed heavy, asphaltenic liquid hydrocarbon. Pet. at 37-38. Instead, Petitioner merely argues that a POSA would have used the drag reducing polymer in Inaoka based on the “well-known economic benefits associated with drag reduction.” Pet. at 38.

Petitioner does not raise any argument about Inaoka that has not already been considered by the Examiner during prosecution—namely that Inaoka would render obvious the claimed heavy, asphaltenic liquid hydrocarbon. *See, e.g., Canon Inc., v. PAPST Licensing GMBH & Co. KG*, IPR No. 2016-01206, Paper No. 15 at 14-15 (PTAB Dec. 15, 2016) (refusing to institute review under 35 U.S.C. § 325(d) because “[w]e decline to revisit an issue that has already been before the Office in prosecution history” since “substantially the same argument regarding patentability of the claimed subject matter over Murata was previously presented to the Office” and this “issue was explicitly addressed several times in response to the Examiner during prosecution”); *Merck Sharp & Dohme Corp. v. Genentech, Inc.*, IPR No. 2016-01373, Paper No. 17 at 8 (PTAB Jan. 3, 2017) (denying institution under §325(d) where one of the pieces of prior art had been considered by the examiner during reexamination of the patent “in the same substantive manner as Petitioner now advocates”). Petitioner is asking the Board to simply reconsider the same evidence and same arguments and reach a different conclusion, without even asserting that (or explaining why) its obviousness

combinations are any different from what have already been considered by the PTO. *See, e.g., Alarm.com Inc. v. Vivint, Inc.*, IPR No. 2015-01967, Paper No. 12 at 20-22 (PTAB Mar. 30, 2016) (denying institution after noting that “Petitioner produces no evidence of any kind to support its *belief* that the Examiner misapprehended [the prior art reference]”); *Kayak Software Corp. v. Int’l Bus. Machines Corp.*, CBM No. 2016-00075, Paper No. 16 at 11-12 (PTAB Dec. 15, 2016) (denying petition under 35 U.S.C. 325(d) where, among other reasons, Petitioner “has not articulated” any “circumstances” where “the prosecution is not as exhaustive, where there are clear errors in the original prosecution, or where the prior art at issue was only cursorily considered”). Doing so would be unwarranted on this record. *See, e.g., Nu Mark LLC v. Fontem Holdings I, B.V.*, IPR No. 2016-01309, Paper No. 11 at 12-13 (PTAB Dec. 15, 2016) (denying institution under 35 U.S.C. §§ 314 and 325(d) and refusing to “second-guess the Office’s previous decision on substantially the same issues”).

Likewise, Petitioner is using Strausz in this Petition in exactly the same way it did in its first Petition. There, too, Petitioner argued that the combination of the primary references with Strausz disclosed that the “drag reducing polymer has a solubility parameter within $4 \text{ MPa}^{1/2}$ of the solubility parameter of the liquid hydrocarbon.” *Compare* Pet. at 42-46 *with* Ex. 2027 [IPR2016-00734, First Petition] at 40-45. It is a waste of Board resources to consider this same prior art

for the same reasons yet again. *Gameloft, S.A. v. Rothschild Digital Media Innovations, LLC*, IPR No. 2016-00472, Paper No. 9 (PTAB June 21, 2016) (denying institution where prior instituted IPR was on the same grounds, against the same claims, and using the same arguments and prior art references).

Moreover, the Board’s discretion to deny institution should be further guided by the fact that Petitioner has not provided a single reason why it could have not have presented all of the following prior art references—the Holtmyer Publication, the Holtmyer Patent, and Inaoka—in Petitioner’s first Petition against the 118 Patent. *Medtronic, Inc. v. Endotech, LLC*, IPR No. 2014-00695, Paper No. 18 at 3-8 (PTAB Sept. 25, 2014) (denying Petitioner’s second petition as an inappropriate “second bite at the apple” where petitioner failed to present argument or evidence to explain why the grounds of unpatentability asserted in the second petition could not have been asserted in the first petition); *US Endodontics, LLC v. Gold Standard Instruments, LLC*, IPR No. 2015-01476, Paper No. 13 at 9-10 (PTAB Oct. 26, 2015) (denying institution of later petition adding two additional grounds and two additional references, where petitioner did not explain why those additional grounds and references could not have been offered in the earlier petition or were “better than any of the prior art” in the first IPR). The Board has denied institution in many other cases when a petitioner, as is the case here, has failed to explain why the references asserted in the later-filed second petition (over six months later in

this case) could not have been presented in the first petition. *See, e.g., Arista Networks, Inc. v. Cisco Sys., Inc.*, IPR No. 2015-01710, Paper No. 7 at 11 (PTAB Feb. 16, 2016) (discretion to exercise § 325(d) discretion “further guided by additional facts” that “Petitioner does not contend specifically that the newly-cited references were not known or available to it at the time it filed [a prior] IPR”); *see also, e.g., Toyota Motor Corp. v. Am. Vehicular Scis. LLC*, IPR No. 2015-00262, Paper No. 10 at 3 (PTAB Jan. 29, 2015) (similar); *Duncan Parking Techs. Inc., v. IPS Group Inc.*, IPR No. 2016-01145, Paper No. 9 at 9-10 (PTAB Nov. 21, 2016) (similar); *Samsung Elecs. Co. v. Rembrandt Wireless Techs., LP*, IPR No. 2015-00555, Paper No. 20 at 7 (PTAB June 19, 2015) (similar); *Conopco, Inc. dba Unilever v. Procter & Gamble Co.*, IPR No. 2014-00506, Paper No. 25 at 4-5 (PTAB Dec. 10, 2014) (informative) (similar); *Butamax*, IPR No. 2014-00581, Paper No. 8 at 12 (similar).

All of the newly-added references were known or should have been known by Petitioner when it filed the first petition on the 118 Patent. Both Inaoka and the Holtmyer Patent are cited on the face of the 118 Patent and were even produced by Petitioner in the co-pending litigation prior to Petitioner filing its first Petition. *See* Ex. 2011 [Feb. 24, 2016 Production e-mail from Petitioner to LSPI, producing documents BH000001-BH011247]; Ex. 2012 [BH003410, Holtmyer Patent]; Ex. 2013 [BH010240, Inaoka]. Therefore, Petitioner was on notice that Inaoka and the

Holtmyer Patent were prior art. *See Ford Motor Co. v. Paice, LLC*, IPR No. 2014-00884, Paper No. 38 at 15 (PTAB Dec. 10, 2015) (noting that Petitioner was “on notice of the existence of potential prior art” that was cited on the face of patent before its initial Petition). Petitioner also should have been aware of the Holtmyer Publication, which mirrors the Holtmyer Patent and whose two authors were both inventors on the Holtmyer Patent. *See, e.g., Nu Mark LLC v. Fontem Holdings 1, B.V.*, IPR No. 2016-01309, Paper No. 11 at 9-10, 12-13 (PTAB Dec. 15, 2016) (denying institution under §325(d) where the disclosures in the prior art used in the IPR were the same “in all material respects” as the contents in two prior art references presented during prosecution where there were overlapping inventors, among other things); (*Praxair Distribution, Inc. . v. Ino Therapeutics LLC*, IPR No. 2016-00781, Paper No. 10 (PTAB Aug. 25, 2016) (denying institution of later petition under §325(d) where references similar to the “new” references were cited during prosecution).

B. The Board Should Deny The Petition On Policy Grounds To Discourage Petitioners From Gamesmanship Using Serial Petitions

Petitioner filed its first Petition on the 118 Patent—and then waited to assess both the POPR and the Board’s institution decision—prior to filing this Petition and three other similar Petitions on three related Patents. Petitioner’s second Petition is replete with changes that address errors in its first Petition that LSPI

identified in its POPR. Filing serial petitions while using LSPI's POPR as a roadmap to prepare a "follow on" Petition is both unfair to LSPI and a waste of both the Board's and the parties' resources. *See Toyota Motor Corp. v. Cellport Sys.*, IPR No. 2015-01423, Paper No. 7 at 8 (PTAB Oct. 28, 2015) (rejecting second Petition because "[s]uch a second bite at the apple wastes the Board's limited resources and imposes undue burden on the Patent Owner" and finding that "the opportunity to read Patent Owner's Preliminary Response in [a first IPR]" prior to filing the second Petition to be "unjust" where there was an overlap in prior art between the two Petitions).

The Petitioner made substantive changes in its expert declaration and Petition related to Strausz, which it reuses in this second Petition. In its POPR to the first Petition, LSPI identified a number of inaccuracies in both the Petition and its expert's declaration related to Strausz. For example, in its first Petition, Petitioner's expert declared that "asphaltene is fully solubilized" in the liquid hydrocarbon at issue, which was a critical assumption to support Petitioner's attempt to quantify the solubility parameter of the liquid hydrocarbon. Ex. 2026 [IPR2016-00734, Dr. Epps Decl.] ¶ 69; *see also* Ex. 2027 at 20 (citing to Dr. Epps testimony). In its POPR, LSPI pointed out that Dr. Epps' assertion was incorrect—Strausz states that the asphaltenes are solid particles that are suspended in crude oil, not fully solubilized in crude oil. Ex. 2003 at 30 ("Specifically,

Strausz states that ‘asphaltenes in petroleums are colloidal systems,’ which means that they exist as solid particles dispersed in the oil rather than being ‘fully solubilized’ in the oil as Petitioner’s expert assumes.”). Based on LSPI’s POPR, Dr. Epps changed his testimony to support the present Petition, now declaring that “asphaltenes were understood to be colloiddally dispersed (present as very small suspended particles) in crude oil” and they would “therefore technically be ‘dispersed’ rather than ‘soluble’ in crude oil.” Ex. 1041 ¶¶ 122, 212; Pet. at 27 (“Because asphaltenes were understood to be present as suspended particles in crude oil...”).

As still another example, Petitioner’s expert contended in the first Petition that, based on Strausz, the solubility parameter of the alleged heavy, asphaltenic crude oil “must fall within a range between 17.1 MPa^{1/2} and 22.1 MPa^{1/2},” and based on another series of assumptions contended that it should be “between 17.1 MPa^{1/2} and 19.6 MPa^{1/2}.” *See, e.g.*, Ex. 2026 ¶¶ 69, 83; *see also* Ex. 2027 at 42 (citing to Dr. Epps testimony). In its POPR, LSPI showed that this alleged range was based on unsupported assertions by Dr. Epps. *See, e.g.*, Ex. 2003 at 27, 29-33. For example, LSPI pointed out that Dr. Epps reliance on the “solubility parameter of asphaltene” as 19.6 MPa^{1/2} was incorrect because Strausz provided additional values “for a variety of different asphaltenes” that range up to 21.90 MPa^{1/2}. *Id.* Based on LSPI’s POPR, Petitioner’s Expert changed his declaration yet again.

Now, he states that “generally” the solubility parameter of a heavy, asphaltenic crude oil would fall within a range between $17.1 \text{ MPa}^{1/2}$ and $22.1 \text{ MPa}^{1/2}$. Ex. 1041 ¶ 137. Also, rather than rely on $19.6 \text{ MPa}^{1/2}$ as he did in the first Petition, Petitioner’s expert now asserts that “at least some, and likely a fairly large proportion, of crude oils having an API gravity of less than about 26° and an asphaltene content of at least 3 weight percent would have solubility parameters between $17.1 \text{ MPa}^{1/2}$ (the lower bounds of the range disclosed by Strausz, which is within $1 \text{ MPa}^{1/2}$ of the solubility parameter of the iDMA homopolymer) and $21.84 \text{ MPa}^{1/2}$ (which is within $4 \text{ MPa}^{1/2}$ of the solubility parameter of the iDMA homopolymer).” Ex. 1041 ¶ 140.

The Board has denied later-filed petitions based on fairness concerns when Petitioners have used serial filings to engage in this type of gamesmanship. *See Duncan Parking*, IPR No. 2016-01145, Paper No. 9, at 9-10 (denying institution of later petition for fairness reasons where it was “against the same claims, of the same patent, using substantially the same prior art, and filed so long apart that petitioner received the benefit of having studied the patent owner’s preliminary response, and the subsequent Board decision, in regard to an earlier petition”); *Ethicon Endo-Surgery, Inc. v. Covidien AG*, IPR No. 2016-00944, Paper No. 8 at 7-8 (PTAB Oct. 24, 2016) (denying institution of a second petition where “this Petition uses our previous decision as a roadmap to remedy the deficiency”).

In addition to preventing unfair gamesmanship, the Petition should be denied because the contradictory statements in Dr. Epps declaration could lead to inconsistent results with Petitioner's earlier IPR that has been instituted on the same patent claims at issue in this later-filed Petition. Petitioner's changed positions materially impact Petitioner's analysis of the limitations "wherein the drag reducing polymer has a solubility parameter within 4 MPa^{1/2} of the solubility parameter of the liquid hydrocarbon" and "suppressing the growth of turbulent eddies," both of which are required by all the claims. Ex. 1001 at 19:35-36, 19:43-45; 20:17-18, 20:25-27; 20:40-41, 20:43-45. For example, reliance on Dr. Epps's statement that asphaltenes are "fully soluble" in the first Petition could conflict with the Board's decision in this case, where Dr. Epps states the opposite. Because of Petitioner's presentation and reliance on inconsistent testimonial evidence, "the risk of inconsistent decisions here and in [Petitioner's first IPR] is particularly significant." *See Alarm.com v. Vivint, Inc.*, IPR No. 2016-01080, Paper No. 11 at 14 (PTAB Nov. 17, 2016) (denying Petition under 35 U.S.C. § 314(a) and 37 C.F.R. § 42.108).

In addition to unfairly using LSPI's POPR to modify its arguments for this Petition, Petitioner also used LSPI's POPR response to add new indefiniteness

arguments in the co-pending litigation.⁶ Ex. 2014 [July 11, 2016 E-mail attaching draft Supp. Invalidity Contentions] (“These supplemental arguments are made in response” to LSPI’s POPR.); Ex. 2015 [July 18, 2016 E-mail serving Supp. Invalidity Contentions]. *See, e.g., Duncan Parking*, IPR No. 2016-01144, Paper No. 9 at 10 (“The potential inequity based on a petitioner’s filing of serial and similar attacks against the same claims of the same patent, while having the opportunity to adjust litigation positions along the way based on either patent owner’s contentions responding to prior challenges or the Board’s decision on prior challenges, is real and cannot be ignored.”). The Board should use its discretion to deny institution of the Petition based on policy grounds. Otherwise, Petitioners would be encouraged to drain the Board’s resources by employing serial-filing tactics to gain unfair advantages and harass patent Owners.

C. Petitioner Provides No Reason Why The Instant Petition Is Not Redundant Of The Earlier Filed Petition

Petitioner has articulated no distinction between the art used in this Petition and the art used in its first Petition. This failure is itself sufficient for the Board to conclude that the grounds are redundant. *ScentAir Techs., Inc. v. Prolitec, Inc.*,

⁶ The Court rejected Baker’s indefiniteness arguments during the claim construction process. Ex. 2016 [Claim Construction Order] at 3-4.

IPR No. 2013-00179, Paper No. 18 at 3 (PTAB Aug. 23, 2013) (“To avoid a determination that a requested ground of review is redundant of another requested ground, a petitioner must articulate a meaningful distinction in terms of relative strengths and weaknesses with respect to application of the prior art reference disclosures to one or more claim limitations.”). The Board has previously declined to consider redundant prior art, particularly when a petitioner offers no meaningful distinction—and in this case no distinction at all—between the different prior art presented in this Petition and the already-instituted IPR.⁷ *See Alarm.com Inc. v. Vivint, Inc.*, IPR No. 2015-01967, Paper No. 12 at 20-22 (PTAB Mar. 30, 2016) (denying petition where the claims were already subject to another IPR and rejecting Petitioner’s contention that the grounds were not cumulative); *Asustek Comput. Inc. v. Exotablet, Ltd.*, IPR No. 2015-00043, Paper No. 6 at 9–10 (PTAB Apr. 23, 2015) (denying petition where claims were already subject to another IPR).

⁷ The Petition fails to even address the primary reference (Eaton) or the Naiman reference in its original Petition for the already-instituted IPR. And Petitioner’s cursory comparison of the Holtmyer Publication and Inaoka concedes that both references fail to disclose the use of a polymer in the claimed heavy, asphaltenic liquid hydrocarbon as required by all claims in the 118 Patent. Pet. at 19.

Moreover, because of the redundancy between the two Petitions, this Petition should be denied under 35 U.S.C. § 315(e)(1). Baker will be estopped from maintaining this IPR as to any claim that is confirmed in the final written decision in the first IPR (which covers the same claims). In particular, the estoppels of § 315(e)(1) apply when three conditions are met: (i) a petitioner is involved in both an earlier-filed IPR and a later-filed IPR; (ii) the earlier-filed IPR results in a final written decision; and (iii) the grounds raised in the later-filed IPR were raised or reasonably could have been raised in the earlier-filed IPR. *Apotex Inc. v. Wyeth LLC*, IPR No. 2015-00873, Paper No. 8 at 6 (PTAB Sept. 16, 2015); *Dell Inc. v. Elecs. & Telecomms. Research, Inst.*, IPR No. 2015-00549, Paper No. 10 at 4-5 (PTAB Mar. 26, 2015).

The three conditions for § 315(e)(1) estoppel would be met here. First, Petitioner filed both its first Petition, which was instituted on all claims of the 118 Patent, and this second Petition. Second, a final written decision would issue in the first IPR well before one could issue here. The final written decision in the first IPR is expected by October 4, 2017 (generally IPR No. 2016-00734, Paper No. 10 (instituting trial on October 4, 2016)), while any potential final written decision here would not be expected until about six months later—*e.g.*, around April 2017. Third, as explained above, Petitioner has provided no explanation for why this prior art could not have reasonably been raised in its first Petition.

Moreover, if the claims are not confirmed, they will be cancelled by the Board in the first IPR. There is no need for the Board to waste its resources by instituting a “follow on” IPR on the same patent claims that will either be confirmed or cancelled in an already-instituted IPR that was initiated by the same Petitioner. *See, e.g., Merck Sharp & Dohme Corp. v. Genentech, Inc.*, IPR No. 2016-01373, Paper No. 17 at 8 (PTAB Jan. 3, 2017) (denying serial Petition under 35 U.S.C. § 325(d) because, among other reasons, “a final written decision will be entered in [the earlier IPR] case well before a final written decision would be entered in the instant proceeding”).

D. All Factors Weigh In Favor Of Denying This Follow-On Petition

Based on the above, each of the six *nVidia* factors listed below weighs strongly in favor of denying the Petition.

(a) the finite resources of the Board;

This Petition is a waste of the finite resources of the Board because it will ultimately be moot based on the results of the first instituted IPR that covers the exact same patent claims.

(b) the requirement under 35 U.S.C. § 316(a)(11) to issue a final determination not later than 1 year after the date on which the Director notices institution of review;

Petitioner's burdensome tactic of filing serial, redundant petitions wastes the Board's limited resources on follow-on Petitions.

(c) whether the same petitioner already previously filed a petition directed to the same claims of the same patent;

The Petitioner filed that first-instituted IPR that covers all of the same patent claims addressed in this follow-on Petition.

(d) whether at the time of filing of the first petition, petitioner knew of the prior art asserted in the second petition or should have known about it;

The Petitioner knew—or should have known—about all of the prior art used for the Grounds in this Petition because Inaoka, the Holtmyer Patent, and Strausz are each listed in the 118 Patent itself, and the Holtmyer Publication is cumulative of the Holtmyer Patent.

(e) whether at the time of filing of the second petition, petitioner already received patent owner's preliminary response to the first petition or received the Board's decision on whether to institute review in the first petition;

When it filed this Petition, Petitioner had received the Patent Owner's Response and the Board's decision for its first Petition—and apparently altered material in this Petition based on those items.

(f) the length of time that elapsed between the time petitioner learned of the prior art asserted in the second petition and filing of the second petition;

Petitioner was aware of the above-mentioned prior art references for many months, if not years, before it filed this Petition.

(g) whether petitioner provides adequate explanation for the time elapsed between the filings of multiple petitions directed to the same claims of the same patent.

Petitioner provides no explanation for its delay in filing this second Petition, much less an adequate explanation for why it filed a single Petition as a “trial balloon,” reviewed the Patent Owner’s Response and the Institution Decision, and then filed this follow-on Petition, along with three new related Petitions. Accordingly, the Board should deny this Petition based on the weight of these factors alone under 35 U.S.C. § 314(a) and 37 C.F.R. § 42.108. *See, e.g., Gen. Plastic Indus. Co. v. Canon Kabushki Kaisha*, IPR No. 2016-01357, Paper No. 16 (PTAB Nov. 14, 2016) (denying second Petition under 35 U.S.C. § 314(a) and 37 C.F.R. § 42.108(a)).

Moreover, this Petition should also be denied under 35 U.S.C. § 325(d) because the substance of the prior art has previously been presented to the PTO in the original prosecution or the first IPR. *See, e.g., Alarm.com Inc. v. Vivint, Inc.*,

IPR No. 2015-01967, Paper No. 12 (PTAB Mar. 30, 2016) (denying institution under §325(d) and 37 C.F.R. § 42.108 where same or substantially the same references were reviewed by examiner during prosecution and raised in prior instituted petition, and petitioner failed to show that the grounds asserted were not cumulative).

IV. Petitioner Fails To Meet Its Burden To Show Each And Every Element Of The 118 Patent Claims Is Present In The Prior Art

A petition must “[p]rovide a statement of the precise relief requested for each claim challenged,” including “[h]ow the construed claim is unpatentable,” and it “must specify where each element of the claim is found in the prior art patents or printed publications relied upon.” 37 C.F.R. § 42.104(b) (emphasis added). Any ambiguity or vagueness in a petition will be resolved against the petitioner. *See, e.g., Tyco Fire Prods. LP v. Victaulic Co.*, IPR No. 2016-00278, Paper No. 13 at 11 (PTAB Sept. 7, 2016) (“Thus, we will address only the basis, rationale, and reasoning put forth by the Petitioner in the petition, and resolve all vagueness and ambiguity in Petitioner’s arguments against the Petitioner.”) (quoting *Liberty Mut. Ins. Co. v. Progressive Cas. Ins. Co.*, CBM No. 2012-00003, Paper No. 8 at 10 (PTAB Oct. 25, 2012)); *adidas AG v. Nike, Inc.*, IPR No. 2016-00920, Paper No. 6 at 6-7 (PTAB Oct. 20, 2016) (“Vagueness in the presentation of a ground does not benefit a petitioner. . . . Those uncertainties and vagaries also

deprive [patent owner] of an appropriate basis for it to formulate a response to the Petition.”).

Petitioner does not identify where the elements of claim 1—the main independent claim it focuses on in the Petition—are found in either of the two primary prior art references. Instead, it simply provides the entire language for claim 1 (Pet. at 19-20 and 34) and then provides an amorphous section in which it states that the Holtmyer Publication “discloses most of the limitations of claim 1” (Pet. at 20) and Inaoka “discloses most of the limitations of claim 1” (Pet. at 35). But Petitioner provides no limitation-by-limitation analysis or claim charts for either of these prior art references with respect to independent claim 1. Pet. at 20-23, 35-37.

It is also unclear what prior art disclosures Petitioner is relying on to contend obviousness. For example, Petitioner mentions multiple ranges from the Holtmyer references, leaving it unclear what range it contends meets the claimed range of “about 0.1 to about 500 ppmw” in the 118 Patent. Pet. at 22-23, 27. Petitioner’s failure to specify where each limitation is allegedly found in the prior art as required by 37 C.F.R. § 42.104(b)(4) is significant and directly impacts Patent Owner’s ability to respond to the Petition.

V. Claim Construction

A. No Claim Constructions Are Proposed By Petitioner

The Petition does not propose any claim constructions.

B. “Asphaltenes” Should Be Construed In Accordance With The Definition In The 118 Specification

The specification in the 118 Patent explicitly defines “asphaltenes:”

“In one embodiment of the present invention, the liquid hydrocarbon can comprise asphaltene compounds. As used herein, “asphaltenes” are defined as the fraction separated from crude oil or petroleum products upon addition of pentane, as described below in Example

3. While difficult to characterize, asphaltenes are generally thought to be high molecular weight, non-crystalline, polar compounds which exist in crude oil.

Ex. 1001 at 2:64-3:4 (emphasis added). Accordingly, LSPI submits that the broadest reasonable construction of “asphaltenes” is “the fraction separated from crude oil or petroleum products upon addition of pentane.” Petitioner has failed to account for the proper construction of this term throughout its obviousness contentions.

VI. The Petition Fails To Demonstrate A Reasonable Likelihood That Any Challenged Claim Is Unpatentable

A. Grounds 1 And 2: The Claims Are Not Obvious

- 1. None Of The Prior Art References Teach Or Suggest The Claimed Method Step Of “Suppressing The Growth Of Turbulent Eddies” In A “Liquid Hydrocarbon Having An**

**Asphaltene Content Of At Least 3 Weight Percent And An
API Gravity Of Less Than About 26°**

The 118 Patent contains method claims. Each such method claim in the 118 Patent requires, among other things, (1) “introducing a drag reducing polymer” (2) “into a liquid hydrocarbon having an asphaltene content of at least 3 weight percent and an API gravity of less than about 26°” (3) “such that the friction loss associated with the turbulent flow through the pipeline is reduced by suppressing the growth of turbulent eddies.” Ex. 1001 at 19:33-38, 20:14-20, 20:38-42, 20:45-48. The limitation—“suppressing the growth of turbulent eddies”—is not satisfied unless successful drag reduction actually occurs when the claimed method is performed. Petitioner’s expert confirmed that “suppress[ing] the growth of turbulent eddies” is the mechanism by which drag reduction occurs. *See, e.g.*, Ex. 1041 ¶ 71. Importantly, each method claim in the 118 Patent requires that drag reduction actually occur as the claimed heavy, asphaltenic liquid hydrocarbon flows through a pipeline (*i.e.*, the method is performed “such that the friction loss associated with the turbulent flow through the pipeline is reduced by suppressing the growth of turbulent eddies.”). Ex. 1001 at 19:33-36, 20:16-18, 20:39-41. The 118 Patent recognizes that conventional drag reducers were unable to achieve drag reduction in the class of heavy, asphaltenic liquid hydrocarbons required by all of the claims in the 118 Patent. Ex. 1001 at 1:44-46 (“Conventional polymeric drag reducers, however, typically do not perform well in crude oils having a low API

gravity and/or high asphaltenic content.”). The ability of the claimed invention to cause the suppression of turbulent eddies during the pipeline transport of a heavy, asphaltenic liquid hydrocarbon was a notable distinction over the prior art during prosecution of the 118 Patent. Ex. 1026 at 10-11. None of the prior art in the Petition teaches or suggests this limitation. Nor does the Petition even assert that the cited prior art discloses this limitation under the construction of “asphaltenes” provided by the explicit definition in the 118 Patent.

a. None of the Prior Art Discloses Drag Reducing The Claimed “Liquid Hydrocarbon Having An Asphaltene Content Of At Least 3 Weight Percent And An API Gravity Of Less Than About 26°”

Petitioner does not contend that any of the four prior art references used in its two Grounds—the Holtmyer Publication, Holtmyer Patent, Inaoka, or Strausz—discloses drag reducing a “liquid hydrocarbon having an asphaltene content of at least 3 weight percent and an API gravity of less than about 26°.” Instead, Petitioner simply claims that heavy, asphaltenic liquid hydrocarbons were known to exist (Pet. at 23-24, 37-38), and their mere existence somehow would have made it obvious to substantially modify the primary references to create a new method to achieve the supposedly “well-known economic benefits” of drag reducing the claimed liquid hydrocarbons—even though Petitioner has no evidence that a POSA had ever attempted it, much less had been able to do it successfully (Pet. at 24-25, 38-39). Petitioner does not allege that adding the pioneering step of drag reducing

the claimed heavy, asphaltenic liquid hydrocarbon that is required by all the claims was within the general knowledge or common sense of a POSA—it instead merely relies on the supposedly “well-known economic benefits.” Even if Petitioner had alleged that it was within the “common sense” of a POSA, the Federal Circuit requires a high standard of proof for such a contention which Baker has not met:

[W]e conclude that while “common sense” can be invoked, even potentially to supply a limitation missing from the prior art, it must still be supported by evidence and a reasoned explanation. **In cases in which “common sense” is used to supply a missing limitation,** as distinct from a motivation to combine, moreover, **our search for a reasoned basis for resort to common sense must be searching.** And, this is particularly true where the missing limitation goes to the heart of an invention.

Arendi S.A.R.L. v. Apple Inc., 832 F.3d 1355, 1363 (Fed. Cir. 2016) (emphasis added).

Petitioner’s argument that a POSA would have supplied this missing limitation from thin air fails for at least three reasons. First, Petitioner cites its expert, Professor Epps to argue that “a person of ordinary skill in the art would have been motivated to introduce the iDMA drag reducing polymer disclosed by Holtmyer into a pipeline containing a flow of crude oil having the claimed asphaltene content and API gravity properties to obtain the well-known economic benefits associated with drag reduction.” *Id.* at 25; *see also id.* at 39 (analysis for

Inaoka). However, Petitioner does not and cannot show that a POSA at that time would have had any reason to believe that successful drag reduction of the claimed heavy, asphaltenic liquid hydrocarbon was even possible, much less that it would produce “well known economic benefits.” *K/S Himpp v. Hear-Wear Techs., LLC*, 751 F.3d 1362, 1365 (Fed. Cir. 2014) (“We agree with Hear–Wear that the Board was correct to require record evidence to support an assertion that the structural features of claims 3 and 9 of the ’ 512 patent were known prior art elements... an assessment of basic knowledge and common sense as a replacement for documentary evidence for core factual findings lacks substantial evidence support.”). In fact, the failure of the prior art to disclose material steps of the claimed invention—such as drag reducing the claimed heavy, asphaltenic liquid hydrocarbon—despite the “economic benefits” ultimately achieved by the claimed invention only underscores its non-obviousness. Pioneering inventions are often “economically profitable,” which tends to prove non-obviousness. *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1337 (Fed. Cir. 2016) (“Demonstrating that an invention has commercial value, that it is commercially successful, weighs in favor of its non-obviousness.”). Yet Petitioner attempts to fill a critical claimed step that is admittedly missing from the prior art by using hindsight to merely identify an economic benefit that was achieved by the claimed invention. If being

“economically profitable” were enough to render obvious a missing claim limitation, then virtually every invention would be obvious.

Second, Petitioner’s analysis is divorced from the prior art references and thus rests entirely on a conclusory declaration. For Ground 1, Petitioner relies on a statement in the Holtmyer Publication that reducing friction loss is “economically profitable” for “hydraulic fracturing of oil and gas wells.” Pet. at 24-2527 (citing Ex. 1005 at 473). For Ground 2, Petitioner does not point to any teaching in the Inaoka reference, but instead points to the Holtmyer Patent, which is mentioned in passing in Inaoka as an example of how to prepare a particular polymer. Pet. at 38-39 (citing Ex. 1006 at 1:56-65). However, Petitioner ignores that both Holtmyer references were focused on economic benefits for hydraulic fracturing—and a POSA would not have used the claimed heavy, asphaltenic liquid hydrocarbon as part of the fracking process in Holtmyer.

For example, the Holtmyer Publication states that “this investigation was undertaken to develop an effective drag reducer **for hydrocarbon fracturing fluids**.” Ex. 1005 at 474 (emphasis added); *id.* at 473 (discussing “hydraulic fracturing of oil and gas wells”); *see also* Ex. 1006 at 1:50-55, 6:33-52. However, neither the Petition nor Petitioner’s expert even mentions hydraulic fracturing, much less acknowledges that the Holtmyer references were focused on hydraulic fracturing. *See, e.g., 10X Genomics, Inc. v. The University of Chicago*, IPR No.

2015-01560, Paper No. 13 at 13 (PTAB Jan. 25, 2016) (rejecting Petitioner’s obviousness argument where there was “no accompanying explanation as to how those references support Petitioner’s argument” and “closer examination of the cited references reveals that they do not support Petitioner’s argument”). Instead, Petitioner’s expert simply asserts in conclusory fashion that a POSA would take drag reducers disclosed for a different endeavor (hydraulic fracturing) in the primary references to create a different method that involves treating a heavy, asphaltenic liquid hydrocarbon without any analysis of the references themselves. Ex. 1041 ¶¶ 114-116, 195-197; Pet. at 24-25, 38-39.

A POSA would not have injected a heavy, asphaltenic fluid into a well as a fracturing fluid because that would have introduced asphaltenes into the system. Indeed, it is well known that “[a]sphaltene precipitation and deposition is considered a menace in the oil industry” and “[i]n the oil fields asphaltenes are known to plug wells, pipelines, surface facilities and sub-surface formations and can even bring production to a halt.” Ex. 2017 [*Effect of Crude Oil Aging on Asphaltene Inhibitor Product Recommendation*] at 1096. Indeed, the portion of the Holtmyer Publication that Petitioner relies on (Pet. at 25-27) focuses on making “hydraulic fracturing” “economically profitable”:

Also, it is **economically profitable** to industrial organizations engaged in movement of large volumes of liquid at high flow rates for

considerable distance as in hydraulic fracturing of oil and gas wells.

Ex. 1005 at 473 (emphasis added). Combining the Holtmyer references with a heavy, asphaltenic fracturing fluid would have frustrated the hydraulic fracking endeavor upon which Holtmyer focuses by introducing undesirable asphaltenes into the process, which could “bring production to a halt,” not make it more economically profitable as Petitioner alleges without any support. Ex. 2017 at 1096.

In any event, it is not Patent Owner’s burden to show that Petitioner’s substantial modification to the prior art would **not** have been obvious. Instead, it is Petitioner’s burden to show a specific basis in the prior art that it would have been obvious. 35 U.S.C. § 316(e); *see also Nike, Inc. v. Adidas AG*, 812 F.3d 1326, 1334 (Fed. Cir. 2016). The expert’s conclusory statements, which fail to even analyze the purpose of the underlying prior art references, are not entitled to any weight. *Dr. Michael Farmwald & Rpx Corp. v. Parkervision, Inc.*, IPR No. 2014-01107, 2015 WL 5453053, at *14 (PTAB Jan. 8, 2015) citing 37 C.F.R. § 42.65 (finding Petitioner RPX’s expert testimony was “conclusory in nature and entitled to little, if any, weight”); *Seabery N. Am., Inc. v. Lincoln Global, Inc.*, IPR No. 2016-00749, 2016 WL 5750860 (PTAB Sept. 21, 2016) (giving “such conclusory, unsupported assertions by Petitioner’s expert little weight”).

Third, even ignoring that the Holtmyer references (which are used in both Grounds 1 and 2) are focused on hydraulic fracturing, which teaches away from the claimed step of drag reducing a heavy, asphaltenic liquid hydrocarbon, Petitioner does not address that, prior to the invention in the 118 Patent, the conventional wisdom of a POSA was that drag reduction of heavy crudes was generally not believed to be a viable option. For example, *Pipeline Transportation of Heavy Oils, a Strategic, Economic and Technological Challenge* (“Saniere”), published in 2004 (before the invention in the 118 Patent), states that there are “five different transportation methods” for heavy crudes. Ex. 2018 at 460. These include dilution, partial upgrading, heat, oil in water emulsion, and core annular flow. *Id.* at 460-461. The fact that the Saniere article never contemplates that drag reduction could even be possible for heavy crude oil shows that a POSA would have not made the hindsight-driven alleged modification that Petitioner asserts would have been obvious. Indeed, Petitioner recently acknowledged in marketing its first heavy crude DRA product (which it first announced in 2014) that “[h]eavy crudes are notoriously difficult to transport via pipeline due to their low API gravity (<20°) and high inherent viscosities (upward of 10 cu. cp at surface temperature and pressure).” Ex. 2019 [*Enhancing Flow for Canadian Crudes*] at 80. Other evidence from Petitioner further undercuts its conclusory, hindsight-

driven analysis, including the statement from Petitioner's scientists in 2012 that "[t]raditional DRA doesn't work in heavy crude." Ex. 2028 [BH013806].⁸

Petitioner's only alleged support for its assertion that a POSA would have fundamentally altered the teachings in the Holtmyer Publication and Inaoka to drag reduce a heavy, asphaltenic liquid hydrocarbon is the conclusory statement of its retained expert. But the expert provides no explanation or actual support to show why a POSA would have been motivated to alter the primary references to include a method step of drag reducing a heavy, asphaltenic crude liquid hydrocarbon, when the prior art references show that POSAs did not even contemplate that drag reducing a heavy crude oil was possible. *See, e.g., Wowza Media Sys., LLC v. Adobe Sys., Inc.*, IPR No. 2013-00054, Paper No. 12 at 14-15 (PTAB Apr. 8, 2013) (declining to institute a trial on proposed obviousness combination because petitioner relied upon "mere conclusory statements"); *Tasco, Inc. v. Pagnani*, IPR No. 2013-00103, Paper No. 6 at 19-20 (PTAB May 23, 2013) (declining to institute a trial on proposed obviousness combination because petitioner's

⁸ While this document is marked "highly confidential," Petitioner confirmed that BH013806 does not contain confidential information and de-designated it. Ex. 2029 [Nov. 21, 2016 E-Mail de-designating BH013806].

challenge “amounts to mere conclusory statements” and failed to identify “why one of ordinary skill in the art would have chosen to modify [a prior art reference] to render claim 1 obvious”); *Synopsys, Inc. v. Mentor Graphics Corp.*, IPR No. 2012-00041, Paper No. 16 at 13-15 (PTAB Feb. 22, 2013) (declining to institute a trial on proposed obvious combination where petitioner failed to “clearly explain the reasoning behind” its “unsupported assertions”).

b. Petitioner’s Obviousness Contention For Ground 1 Depends On A Fundamental Error About The Holtmyer Patent

While Petitioner does not contend that the Holtmyer Patent discloses the claimed heavy, asphaltenic liquid hydrocarbon, Petitioner nonetheless states that the “Holtmyer Patent addresses the effect of asphaltene content on the ability of the iDMA polymer to achieve drag reduction.” Ex. 1041 ¶ 119; *see also* Pet. at 26-27. This is incorrect and fatal to Ground 1. **The Holtmyer Patent does not even mention asphaltene**, much less address the effect of asphaltene content on the ability of the iDMA polymer to achieve drag reduction. Unsurprisingly, the Petition does not actually cite **any** portion of the Holtmyer Patent in Ground 1 in

its Petition. *See* Pet. at 26-28. Instead, Petitioner merely relies on its expert's declaration, which provides no factual basis on this critical point.⁹

To incorrectly contend that the Holtmyer Patent addresses asphaltenes, Dr. Epps relies on the statement in the Holtmyer Patent that “the polymer additive is used with a well-treating fluid containing sand or other solid agent suspended therein.” *See* Ex. 1041 ¶¶ 121, 133, citing Ex. 1006 at 4:63-65. But this has nothing to do with asphaltenes. As discussed above, the Holtmyer Publication and Patent were focused on hydraulic fracturing, where a hydrocarbon “fracturing fluid” is injected into the well to “fracture hydrocarbon bearing rock formations.” Ex. 1005 at 474. The “sand or other solid agent” refers to “propping agents” which would be used in the fracking fluid (*e.g.*, “well-treating fluid”), not asphaltenes. “Propping agents” are well known and available commercially. *See, e.g.*, Ex. 2020

⁹ This is also improper incorporation by reference and this Ground should be rejected on that basis alone. *See* 37 C.F.R. § 42.6(a)(3) (prohibiting incorporation by reference); *see generally* *Cisco Sys., Inc., v. C-Cation Techs., LLC*, Case IPR No. 2014-00454, Paper No. 12 at 9–10 (PTAB Aug. 29, 2014) (expanded panel decision explaining that arguments not made in the Petition will not be considered).

[Ceramic Proppant]. They are generally sand, resin coated sand, or ceramics. Ex. 2006 (listing silica sand, bauxite, ceramic oxides, and polymer-coated sand as proppants). The American Petroleum Institute has published a standard describing the required properties of “propping agents,” including size, shape, and strength. *Id.* (citing “Recommended Practices for Testing Sand Used in Hydraulic Fracturing Operations,” RP 56, API, Dallas (1983)).

Contrary to Dr. Epps’ unsupported assertion, a POSA would not have injected asphaltene into a well as a “propping agent” as part of the fracking process in Holtmyer. Asphaltene is considered a “menace” in oil fields:

Asphaltene precipitation and deposition is considered a menace in the oil industry. In the oil fields asphaltenes are known to plug wells, pipelines, surface facilities and sub-surface formations and can even bring production to a halt.

Ex. 2017 at 1096. The paper further notes that “asphaltene deposition” is a “problem” in the industry. *Id.* A POSA would not have been motivated to create this “problem” by attempting to inject asphaltene as a “propping agent” into a well during production where it is known “to plug wells.” Nor does Dr. Epps cite anything to support his contention that the “sand or other solid agent” in a “well-treating fluid” would, or could ever be, “asphaltenes.” In fact, Dr. Epps states the opposite—that precipitation of asphaltenes “within a conduit can severely restrict the flow of crude oil, which is highly undesirable.” Ex. 1041 ¶ 105. His

acknowledgment that asphaltene precipitation is an “undesirable” problem rebuts his conclusory assertion that a POSA would have been motivated to proactively inject a heavy, asphaltenic crude into a well as a fracturing fluid. His conclusory assertion should be given no weight.

The unreliability of Dr. Epps’s statement that asphaltenes would be selected as a propping agent is confirmed by another of Petitioner’s own experts in the co-pending litigation, Dr. Fetzer, a scientist formerly at Chevron. Dr. Fetzer testified that Dr. Epps “doesn’t know anything about asphaltenes.” Ex. 2021 [Fetzer Depo.] at 255:13-20. Moreover, this latest position by Dr. Epps—that asphaltenes are solid particles and can thus be propping agents—contradicts his earlier positions in his declaration in support of the first Petition. In his first declaration, Dr. Epps stated that “asphaltene is fully solubilized” by the crude oil, which was critical to his opinion on the solubility parameter of the liquid hydrocarbon. Ex. 2026 ¶ 69. Now, Petitioner’s sole argument that the Holtmyer Patent addresses asphaltenes depends on Dr. Epps’s contradictory opinion that the asphaltenes are solid particles that are not solubilized by the crude oil. The Board should not credit fundamentally inconsistent positions in the two declarations of Petitioner’s expert. *Tarleton LLC v. State Farm Fire & Cas. Co.*, No. 3:12-CV-00989-AC, 2014 WL 2126567, at *8 (D. Or. May 21, 2014), *aff’d sub nom.*, *Tarleton LLC v. State Farm Fire & Cas. Ins. Co.*, No. 14-35540, 2016 WL 7047998 (9th Cir. Dec. 5, 2016)

(striking portions of the expert declaration where “Younie’s declaration statement that he found no evidence or data which allowed him to conclude heat was a factor clearly contradicts with the conclusion of his expert report that heat was a ‘trigger’ of the collapse”).

c. Petitioner Has Not Shown That Its Hypothetical Obviousness Combinations Would Have “Suppress[ed] The Growth of Turbulent Eddies” In The Heavy, Asphaltenic Liquid Hydrocarbon Required By All Claims

Petitioner has not shown that the claim requirement of “suppressing the growth of turbulent eddies” in the claimed heavy, asphaltenic liquid hydrocarbon would have been satisfied by its hypothetical obviousness combinations in either Ground. Petitioner glosses over this by merely focusing on the admitted absence of the claimed heavy, asphaltenic liquid hydrocarbon from the prior art. Pet. at 23, 37. Petitioner cannot fill the missing drag reduction limitation (*i.e.*, “suppressing the growth of turbulent eddies ...”) by pointing to disclosures involving drag reduction of materially different fluids that do not meet the “API gravity” and “asphaltene content” limitations of the 118 Patent claims because Petitioner has provided no showing that the hypothetical prior art combination would have satisfied the claim limitations (*e.g.*, “suppressing the growth of turbulent eddies”) for a heavy, asphaltenic liquid hydrocarbon.

Petitioner's failure of proof is shown by the 118 Patent itself. The Petition simply ignores the unexpected results shown in the 118 Patent for heavy, asphaltenic liquid hydrocarbons and the evidence in the 118 Patent that conventional methods for drag reducing light and medium liquid hydrocarbons were not a viable solution for the claimed heavy, asphaltenic liquid hydrocarbon. For example, the 118 Patent shows that a conventional drag reducer, LP 100, achieved significant drag reduction (*i.e.*, "suppressing the growth of turbulent eddies") in a light crude oil with an API gravity of 40° (Ex. 1001 at 17:13-14, Table 2); yet LP 100 achieved no drag reduction in Albion Heavy Sour crude oil, a heavy, asphaltenic liquid hydrocarbon. Ex. 1001, Tables 1 and 3.

While Petitioner's expert acknowledges in his declaration that the effectiveness of a drag reducing agent depends on more than just solubility (Ex. 1041 ¶ 200), Petitioner provides no support for its assertion that the drag reducing polymer "would be effective at reducing drag in crude oil having the claimed properties" other than an alleged solubility parameter match. For example, for the Holtmyer Publication, Petitioner states that "[b]ecause the solubility parameter of the iDMA polymer (17.84 MPa^{1/2}) falls squarely within the range disclosed by Strausz," a POSA would have expected there to be drag reduction. Pet. at 29-32.

Petitioner's flawed analysis ignores other requirements that Petitioner's expert has testified are necessary for a drag reducer to "suppress the growth of

turbulent eddies.” For example, Dr. Epps has testified that the effectiveness of drag reducers also critically depends on “shear resistance for the polymer to effectively function as a drag reducing polymer in crude oil.” Ex. 2022 [Epps Depo.] at 49:2-4. Yet neither Petitioner nor Dr. Epps even assert that any of the drag reducing polymers in the Grounds have the necessary shear resistance to satisfy the claim limitations (*e.g.*, “suppression of turbulent eddies”) in a heavy, asphaltenic liquid hydrocarbon flowing in a pipeline. This failure of proof is fatal to the Grounds in the Petition. *Symantec Corp. v. Finjan, Inc.*, IPR No. 2015-01546, Paper No. 9 at 24 (PTAB Jan. 14, 2016) (rejecting obviousness combination where Petitioner failed to show that a limitation was met). Petitioner’s failure of proof is underscored by Dr. Epps’ inability to identify any polymer in the prior art that would actually cause drag reduction in a heavy asphaltenic liquid hydrocarbon. Ex. 2022 at 52:10-14. Accordingly, Petitioner’s unsupported arguments that it would have been obvious to achieve the unexpected results of the claimed invention—including successful drag reduction (“suppression of turbulent eddies”) in a heavy, asphaltenic liquid hydrocarbon—amount only to “mere conclusory statements,” not the “articulated reasoning with some rational underpinning” that is required “to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (quoted with approval in *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007)).

2. Petitioner's Obviousness Analysis Fatally Depends On Hindsight Reconstruction

Petitioner's obviousness analysis also fails because Petitioner's combination of the primary references with the claimed, heavy asphaltenic liquid hydrocarbon is based on hindsight gleaned from the inventive contributions in the 118 Patent itself, which is impermissible. Petitioner has no evidence that any POSA was aware that the asphaltene content of a crude oil was an important factor to be considered for drag reduction prior to the invention in the 118 Patent. Likewise, Petitioner's reliance on Strausz, which was disclosed in the specification of the 118 Patent, is also based on impermissible hindsight. Petitioner has no evidence that any POSA would have (1) considered the asphaltene content in a liquid hydrocarbon or (2) looked to Strausz (which is non-analogous art that does not even address drag reduction) in attempting to solve drag reduction issues prior to the invention in the 118 Patent.

An obviousness analysis must "avoid hindsight reconstruction by using the patent in suit as a guide through the maze of prior art references, combining the right references in the right way so as to achieve the result of the claims in suit." *In re NTP, Inc.*, 654 F.3d 1279, 1299 (Fed. Cir. 2011) (citations omitted); *see also Cheese Sys., Inc. v. Tetra Pak Cheese & Powder Sys., Inc.*, 725 F.3d 1341, 1352 (Fed. Cir. 2013) ("Among the difficult challenges of applying the doctrine of obviousness is avoidance of even a hint of hindsight."); *ATD Corp. v. Lydall, Inc.*,

159 F.3d 534, 546 (Fed. Cir. 1998) (“Determination of obviousness can not be based on the hindsight combination of components selectively culled from the prior art to fit the parameters of the patented invention.”). Rather, Petitioner must provide some affirmative evidence showing why a POSA would have combined a prior art reference with a missing element or other prior art references, and how they would have been combined, to arrive at the claimed invention. *See, e.g., Purdue Pharma L.P., v. Depomed, Inc.*, IPR No. 2014- 00379, Paper No. 72 at 25-28 (PTAB July 8, 2015) (determining claims were not obvious because “Petitioner has not explained persuasively *how or why* a person of ordinary skill in the art would have combined” the features in the two references and “by defining the nature of the problem to be solved as the specific problem solved by the invention, Petitioner has relied on impermissible hindsight to supply the reason to combine the references”) (emphasis in original), *aff’d*, 643 F. App’x 960, 961 (Fed. Cir. 2016).

Petitioner provides no explanation for why a POSA would have allegedly targeted the asphaltene content of a crude oil in the context of drag reduction. For example, the Petitioner’s expert simply states that a POSA would have introduced the drag reducer “into a pipeline containing a flow of crude oil having the claimed asphaltene content and API gravity properties to obtain the well-known economic benefits associated with drag reduction.” Ex. 1041 ¶¶ 116, 197. The mere

identification of a possible end-benefit, however, does not substitute for a reasoned explanation for why the combination would have been obvious. *See, e.g., Kaspersky Lab, Inc. v. Uniloc USA, Inc.*, IPR No. 2015-00178, Paper No. 10 at 8-11 (PTAB Apr. 21, 2015) (institution denied where there was “little more than an identification of an end-benefit from a particular combination, not an explanation of why it would have been obvious” to make the proposed combination). None of the Holtmyer Publication, the Holtmyer Patent, and Inaoka discloses anything about asphaltenes. Nor have Petitioner or its expert provided any showing that a POSA would have actually considered the asphaltene content of a crude oil in the context of drag reduction. Indeed, Petitioner’s expert could not identify anyone who had previously used asphaltene content for designing a DRA polymer:

Q. Sir, are you aware of any person anywhere that ever attempted to design a DRA polymer based on the asphaltene content of a crude oil prior to the filing of the ’118 patent?

A. I have no opinion on that question.

Ex. 2022 at 133:4-9 (objection omitted). This is the epitome of a hindsight-driven analysis because it improperly defines the “problem to be solved” in terms of inventive aspects contributed in the 118 Patent, namely the impact of asphaltene on DRA effectiveness. *See Insite Vision Inc. v. Sandoz, Inc.*, 783 F.3d 853, 859 (Fed. Cir. 2015) (“Defining the problem in terms of its solution reveals improper

hindsight in the selection of the prior art relevant to obviousness. And, here, the district court recognized that an overly narrow statement of the problem [can] represent[] a form of prohibited reliance on hindsight, [because] [o]ften the inventive contribution lies in defining the problem in a new revelatory way.”) (citations omitted).

Indeed, Dr. Epps testified he had no opinion about whether any specific polymer would actually cause drag reduction in heavy asphaltenic crude oil. Ex. 2022 at 52:10-14. Yet Dr. Epps nonetheless argues in his declaration, without any support, that a POSA would have made a fundamental departure from the cited prior art by targeting asphaltene content, which is not even mentioned in the references at issue. The Petitioner’s hindsight-driven approach focuses precisely on one of the inventive contributions in the 118 Patent and must be rejected.

3. The Claims Are Also Not Obvious Because The Cited Prior Art Teach Away From Using The Claimed Heavy, Asphaltenic Liquid Hydrocarbon

In addition to the fact that there is no suggestion or motivation in the cited prior art to alter the references to add the claimed step of drag reducing a heavy asphaltenic liquid hydrocarbon, Petitioner’s obviousness arguments fails because the prior art teaches away from the claimed invention. “A reference may be said to teach away when a person of ordinary skill, upon reading the reference, ... would

be led in a direction divergent from the path that was taken by the applicant. ...”
Tec Air, Inc. v. Denso Mfg. Michigan Inc., 192 F.3d 1353, 1360 (Fed. Cir. 1999).

Both Grounds 1 and 2 rely on the Holtmyer references as evidence for why a POSA would have modified the primary references to use their drag reducers with the claimed heavy, asphaltenic liquid hydrocarbon. Pet. at 24-25, 38-39. As discussed above, the Holtmyer references focus on hydraulic fracturing and drag reducers for the fracturing fluid that is injected into the well. Petitioner does not acknowledge this, much less address what would have allegedly led a POSA to using the claimed heavy, asphaltenic liquid hydrocarbon as a fracturing fluid in such a scenario. It is unreasonable to assume that a POSA would have purposefully injected asphaltenes into a formation as a fracturing fluid when asphaltene is a known “menace” in oil fields and is “known to plug wells, pipelines, surface facilities and sub-surface formations and can even bring production to a halt.” Ex. 2017 at 1096. Even Petitioner’s expert admits that precipitation of asphaltenes “within a conduit can severely restrict the flow of crude oil, which is highly undesirable.” Ex. 1041 ¶ 105. The obviousness Grounds must be rejected in view of the cited prior art’s teaching away from the claimed step of drag reducing the heavy, asphaltenic liquid hydrocarbon. *See Securus Techs., Inc., v. Global Tel*link Corp.*, IPR No. 2016-00269, Paper No. 7

(PTAB June 8, 2016) (declining to institute Petition where reference taught away from the claimed invention).

B. Ground 1: The Claims Are Also Not Obvious Because The Holtmyer References Do Not Disclose Introduction Of The iDMA Polymer Into “A Liquid Hydrocarbon Having ... An API Gravity Of Less Than About 26°... In The Range From About 0.1 To About 500 PPMW”

Every claim of the 118 Patent requires introduction of the drag reducing polymer into “a liquid hydrocarbon having ... an API gravity of less than about 26° ... in the range from about 0.1 to about 500 ppmw.” Ex. 1001 at 19:46-47; 20:35-36; 20:63-64. Petitioner contends that the Holtmyer Publication discloses this limitation. Pet. at 23. However, this is incorrect. Petitioner relies solely on QC-1156 as the claimed liquid hydrocarbon because it is the only fluid in the Holtmyer references with an API gravity in the claimed range. See Ex. 1005 at 476, Table 9 (stating QC-1156 has an API gravity of 22.5°).¹⁰ The only mention of QC-1156 (the alleged “liquid hydrocarbon”) is in Table 9, which summarizes a test result in which the iDMA polymer was introduced at 600 ppmw, which is outside the

¹⁰ As discussed above, Petitioner concedes that the Holtmyer references do not disclose any liquid hydrocarbon that satisfies the claimed asphaltene content. Pet. at 23.

claimed range of “0.1 to about 500 ppmw.”¹¹ *See* Ex. 1005 at 476, Table 9. Therefore, this claimed range, which is required by every claim in the 118 Patent, is not met by the Holtmyer Publication.

Petitioner glosses over this by pointing to other test results at lower polymer concentrations, but none of these involved QC-1156 or any heavy liquid hydrocarbon having an API gravity of “less than about 26°” as required by the claims. Nor does Petitioner or its expert claim that they do. *See, e.g.*, Pet. at 22-23; Ex. 1041 ¶¶ 72-75. The examples cited by Petitioner involved kerosene. *Id.* \Even if the Board were to rely on the examples involving kerosene, the range is far higher than the claimed range. While Petitioner incorrectly claims there is a range “from 300 ppm (0.03 wt.%) to 600 ppm (0.06 wt.%)” by citing to Table 8 in the Holtmyer Publication, this table actually shows a range up to 9,600 ppm—and it is only for kerosene, which the Examiner noted was “materially distinct” than the liquid hydrocarbon in the claims.¹² Ex. 1026 at 10.

¹¹ Petitioner’s expert explains that .06 wt.% equates to 600 ppm. Ex. 1041 ¶ 73.

¹² Table VI of the Holtmyer Patent provides results from the same testing in Table 8 of the Holtmyer Publication and confirms that the tables relate to testing of iDMA in kerosene. Ex. 1006 at 9:45-75, Table VI.

Part of the benefit of the invention in the 118 Patent is that it provides for drag reduction in the claimed heavy, asphaltenic crudes at relatively low concentrations of the drag reducer, *i.e.*, “about 0.1 to about 500 ppmw.” Indeed, the claimed range of “about 0.1 ppm to about 500 ppmw” in the 118 Patent was added by the Patent Owner to distinguish prior art on April 8, 2011. Ex. 1025 at 2, 4, 7 (April 8, 2011 Response to Office Action) (adding range of “about 0.1 ppm to about 500 ppmw” to distinguish prior art). Shortly thereafter, the Examiner issued a Notice of Allowance on May 11, 2011 that found the 118 Patent claims to be patentable in part because the prior art did not meet this limitation. Ex. 1026 at 11 (May 11, 2011 Notice of Allowance) (issuing notice of allowance because, among other reasons, “Castner adds the polymer in amounts that fall outside the claimed range” and “Ball adds the polymer in amounts that fall outside the claimed range”). Where a claimed range is important to the invention, an overlapping range in a prior art reference does not disclose the claimed range. *OSRAM Sylvania, Inc. v. Am. Induction Techs., Inc.*, 701 F.3d 698, 706 (Fed. Cir. 2012) (reversing district court where claimed range of “less than 0.5 torr” was central to the invention and therefore not disclosed by prior art reference’s range of “approximately 1 torr or less”); *Atofina v. Great Lakes Chem. Corp.*, 441 F.3d 991, 1000 (Fed. Cir. 2006) (reversing district court’s finding of invalidity where the patent at issue claimed a temperature range of 330 to 450°C and the prior art reference disclosed a range of

100 to 500°C with a preferred range of 150 to 350°C, because the reference “does not disclose a specific embodiment of the claimed temperature range” and the prosecution history described the range as critical to the invention); *Allergan, Inc. v. Sandoz Inc.*, 796 F.3d 1293, 1306 (Fed. Cir. 2015) (finding the claims were not obvious because “the record shows that the claimed amounts of the two different ingredients could and did materially and unpredictably alter the property of the claimed formulation”).¹³

VII. Conclusion

LSPI respectfully submits that the Petition should be dismissed and/or denied for at least the foregoing reasons. Because this is LSPI’s Preliminary Response, it is not a comprehensive rebuttal to all arguments raised in the Petition. LSPI reserves the right to contest the Petition on all grounds permitted under the

¹³ Petitioner also mentions a range of “160 ppm to 1,600 ppm,” but the Petition does not contend that this meets the claimed range and only mentions it for a different claim limitation. Pet. at 22-23. Nor could it because the “160 ppm to 1,600 ppm” range was not disclosed for QC-1156 and also goes well beyond the claimed range of “about 0.1 ppm to about 500 ppmw” in the 118 Patent that was used to distinguish prior art. See *Allergan*, 796 F.3d at 1306-1307.

applicable rules. Nothing herein should be construed as a concession or admission by LSPI as to any fact or argument in the Petition.

Dated: January 17, 2017

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24 *et seq.*, the undersigned certifies that this document complies with the type-volume limitations. This document contains fewer than 14,000 words as calculated by the “Word Count” feature of Microsoft Word 2010, the word processing program used to create it.

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CERTIFICATE OF SERVICE

I hereby certify that on January 17, 2017, a copy of **LIQUIDPOWER SPECIALTY PRODUCTS, INC.'S PRELIMINARY RESPONSE TO PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,022,118 PURSUANT TO 37 CFR § 42.107** was served by filing this document through the Patent Review Processing System as well as delivering a copy via electronic mail upon the following:

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