

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ARCADIS U.S., INC.,
Petitioner,

v.

BRICE ENVIRONMENTAL SERVICES CORP.,
Patent Owner.

IPR2022-01174
Patent 7,399,141 B2

Before JAMES A. TARTAL, CARL M. DeFRANCO, and
RICHARD H. MARSCHALL, *Administrative Patent Judges*.

TARTAL, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Arcadis U.S., Inc., (“Petitioner”) filed a Petition pursuant to 35 U.S.C. §§ 311–319 requesting an *inter partes* review of claims 1–27 (“the Challenged Claims”) of U.S. Patent No. 7,399,141 B2 (Ex. 1001, “the ’141 patent”). Paper 1 (“Pet.”). Brice Environmental Services Corp. (“Patent Owner”) filed Patent Owner’s Mandatory Notice. Paper 4. Patent Owner did not file a preliminary response to the Petition.

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314(b) (2018); 37 C.F.R. § 42.4(a) (2019). An *inter partes* review may not be instituted “unless . . . the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). Moreover, a decision to institute under 35 U.S.C. § 314 may not institute on fewer than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

Upon consideration of the Petition and the evidence presented in the Petition, we conclude that the information presented shows a reasonable likelihood that Petitioner would prevail in showing the unpatentability of at least one of the Challenged Claims. Accordingly, we authorize an *inter partes* review to be instituted as to the Challenged Claims of the ’141 patent on the grounds raised in the Petition. Our factual findings and conclusions at this stage of the proceeding are based on the evidentiary record developed thus far (prior to Patent Owner’s Response). This is not a final decision as to patentability of claims for which *inter partes* review is instituted. Any final decision will be based on the record, as fully developed during trial.

II. BACKGROUND

A. *The '141 Patent*

The '141 patent issued July 15, 2008, from an application filed on November 8, 2006, and is directed to “a method and system for removing contaminants from soil” that “involves the evaluation and treatment of soil contaminated by material of density and/or size different from the native soil material.” Ex. 1001, 4:17–21, codes (21), (22), (45). As background, the '141 patent states that one typical contamination site “involves weapons firing ranges (e.g. small arms fire) where heavy metal contamination is a serious on-going problem.” *Id.* at 2:11–13. According to the '141 patent, “no technology has been available that can simultaneously reduce both total and leachable contaminant concentrations (e.g., lead) and render soil acceptable for reuse.” *Id.* at 2:47–49. The '141 patent provides a method and system that “utilizes a particle separation process for detoxifying soil contaminated by undesirable particulates and leachable contaminants including heavy metals.” *Id.* at 3:4–8.

The '141 patent describes a “soil diagnostic testing and sampling facility . . . adapted to take a representative soil sample and test the sample for contaminants prior to configuring and optimizing a full-scale contaminated solid removing facility 100.” *Id.* at 6:65–7:2. According to the '141 patent, “[w]hen the material evaluation is complete, the size and density fractions that need to be separated to produce acceptable soil is known, and a full scale plant configuration can be optimized therefrom.” *Id.* at 7:34–37.

According to the '141 patent, “the concept of particle separation is over 100 years old,” and “the present inventors pioneered its application for remediating metals-impacted soils” with a process that “relies upon the refinement and reconfiguration of the components to provide higher throughputs from a physically smaller transportable plant.” *Id.* at 12:2–7. The system provides processing steps, including “Physical Sizing” using sequential wet screening 6, “Soil Classification/Attrition” using sand screws 28 and 74 coupled with water flow, “Gravity Separation” at density treatment system 53, “Magnetic Separation” at cross belt magnet with conveyor 3, “Dewatering/Water Treatment 90,” “Vegetation Removal” at soil organic matter storage bin 92, “Stabilization” using flocculant 39 and/or 45, “Oxidation/Reduction,” and “Microbial Remediation.” *Id.* at 12:8–13:59.

Figure 3 of the '141 patent is reproduced below.

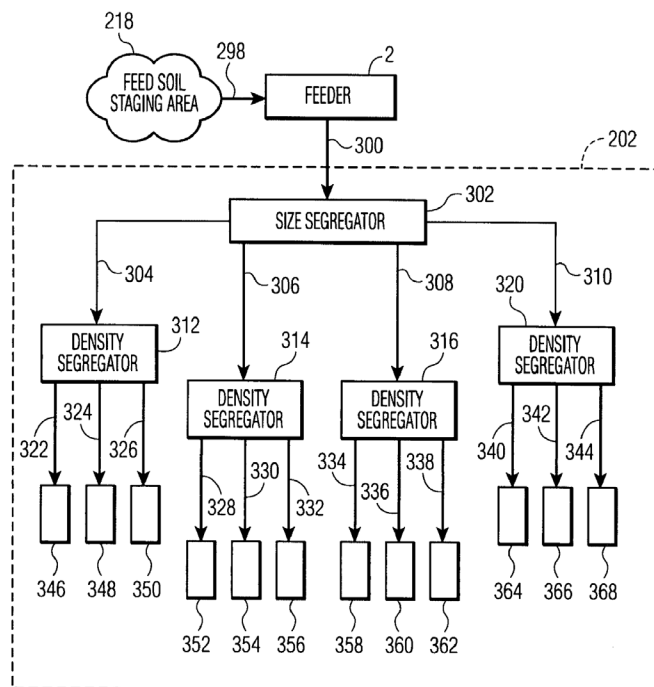


FIG. 3

Figure 3 “is a block diagram showing a site layout of a sample prep area . . . in operation with a feeder and conveyor system.” *Id.* at 4:11–13. Sample prep area 202 accommodates “a soil diagnostic testing and sampling facility . . . adapted to take a representative soil sample and test the sample for contaminants prior to configuring and optimizing a full-scale contaminated soil removing facility 100.” *Id.* at 6:62–7:2. Sample prep area 202 “includes a size segregator 302, a plurality of density segregators 312–320 each connected via a corresponding conveyor apparatus 304–310 to the size segregator 302, and a plurality of soil diagnostic testing and sampling kits 346–368 each for receiving the output of the corresponding density segregator 312–320 via a corresponding conveyor apparatus 322–344.” *Id.* at 7:9–16. According to the ’141 patent, “[o]nce, the soil testing is complete, the size and density fractions that need to be isolated can be determined to configure the contaminated soil removing facility 100.” *Id.* at 7:30–33.

B. Illustrative Claim

Petitioner challenges claims 1–27 of the ’141 patent. Pet. 2. Claims 1 and 20 are independent. Claims 2–19 depend from claim 1 and claims 21–27 depend from claim 20. Claim 1 is illustrative of the claimed subject matter and is reproduced below.

1. A system for removing contaminants from contaminated soil at a site, comprising:
 - a soil diagnostic testing and sampling facility comprising:
 - means for extracting a representative sample of the contaminated soil from the site;
 - means for segregating the sample into a plurality of size fractions according to particle size without any testing for contaminants being made;

- means for segregating each of the size fractions into a plurality of density fractions according to particle density prior to testing for contaminants; and
- means for testing the plurality of density fractions to identify contaminated fractions containing the presence of unacceptable levels of contaminants representing at least a portion of the total contaminant amount of the sample; and
- a contaminated soil removing facility adapted for removing soil fractions from the contaminated soil at the site corresponding to the contaminated fractions from the sample as identified by the soil diagnostic testing and sampling facility, said contaminated soil removing facility further comprising:
 - means for extracting the contaminated soil from the site;
 - means for isolating soil fractions from the contaminated soil at the site corresponding to the identified contaminated density fractions from the sample;
 - means for processing the isolated soil fractions to remove the contaminants therefrom;
 - means for treating the processed soil fractions from the site corresponding to the identified contaminated fractions with at least one stabilization reagent formulated for inhibiting the solubility of metal contaminants remaining in the processed soil; and
 - means for returning the treated soil fractions to the site.

Ex. 1001, 27:12–45.

C. Asserted Grounds of Unpatentability

Petitioner asserts that the Challenged Claims are unpatentable based on the following grounds:

Claims Challenged	35 U.S.C. §¹	References/Basis
1–16, 20, 21, 25–27	103(a)	Olin, ² ITRC ³
17–19, 22–24	103(a)	Olin, ITRC, Conca ⁴
1–11, 13–27	103(a)	BDM, ⁵ 1998, ⁶ Bovendeur, ⁷ Conca

¹ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. We apply the pre-AIA version of § 103 here because the ’141 patent issued before March 16, 2013. Ex. 1001, code (45).

² Trudy J. Olin, et al., *Physical Separation (Soil Washing) for Volume Reduction of Contaminated Soils and Sediments: Processes and Equipment*, EPA (1999) (Ex. 1004, “Olin”). Consistent with the Petition, when citing Olin we refer to the original pagination, not to the added bates page numbering.

³ Interstate Technology and Regulatory Council, *Characterization and Remediation of Soils at Closed Small Arms Firing Ranges* (2003) (Ex. 1005, “ITRC”).

⁴ U.S. Patent No. 6,217,775 B1, issued April 17, 2001 (Ex. 1016, “Conca”).

⁵ BDM Engineering Services Company, *Demonstration of Physical Separation/Leaching Methods for the Remediation of Heavy Metals Contaminated Soils at Small Arms Ranges* (1997) (Ex. 1003, “BDM”).

⁶ Michael J. Mann et al., *Innovative Site Remediation Technology: Design and Application Liquid, Extraction Technologies*, Am. Academy of Environmental Engineers (1998) (Ex. 1013, “1998”).

⁷ J. Bovendeur and R. Mozley, *Characterisation and Treatment of Polluted Material by Environmental Application of Mineral Processing Technology*, XVIII International Mineral Processing Congress (1993) (Ex. 1009, “Bovendeur”).

Pet. 2–3. Petitioner further relies on the supporting Declaration of John Bergendahl, dated June 21, 2022. (Ex. 1065).⁸ Dr. Bergendahl supports Petitioner’s contention that the asserted references constitute prior art, which, at this stage of the proceeding, Patent Owner has not disputed. *See* Ex. 1065 ¶¶ 153–155, 161–164, 169–172, 185–187, 193.

D. Related Proceedings

The parties identify the ’141 patent as a subject of *Brice Environmental Services Corp. v. Arcadis U.S., Inc.*, C.A. No. 3:21-cv-00141-JMK, pending in the United States District Court for the District of Alaska. Pet. 1; Paper 4, 1.

E. Real Parties in Interest

Petitioner identifies Clean Earth Technologies, Inc., as an additional real party in interest. Pet. 1. Patent Owner identifies “Calista Corporation, an Alaska Native regional corporation formed pursuant to the Alaska Native Claims Settlement Act of 1971 and owned by Alaska Natives” as a real party in interest. Paper 4, 1.

III. ANALYSIS

A. Legal Standards for Obviousness

A patent claim is unpatentable for obviousness if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). In *Graham v. John Deere Co.*, 383 U.S. 1 (1966), the Supreme Court set out a

⁸ Petitioner also relies on the Declaration of Laura A. Whitbeck (Ex. 1063) and the Declaration of Joseph A. Quinnan (Ex. 1064) in support of its contentions that references relied upon are authentic and prior art.

framework for assessing obviousness that requires consideration of four factors: (1) the “level of ordinary skill in the pertinent art,” (2) the “scope and content of the prior art,” (3) the “differences between the prior art and the claims at issue,” and (4) “secondary considerations” of nonobviousness such as “commercial success, long felt but unsolved needs, failure of others, etc.” *Id.* at 17–18; *KSR*, 550 U.S. at 407. At this stage of the proceeding there is no dispute as to the level of ordinary skill in the art and neither party presents evidence or argument directed to secondary considerations.

B. Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citation omitted). Petitioner contends that a person of ordinary skill in the art at the time of the invention would have had “at least a bachelor’s degree in environmental science or environmental, civil or chemical engineering and 4–5 years of experience working in the field of soil remediation, or an equivalent combination of education and/or experience in related fields.” Pet. 9 (citing Ex. 1065 ¶¶ 24–25).

For purposes of this Decision, we find that the ’141 patent and the cited prior art references reflect the appropriate level of skill at the time of the claimed invention and that the level of appropriate skill reflected in these references and in the ’141 patent is consistent with this level of skill proposed by Petitioner. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Accordingly, for purposes of this decision on institution, this is the definition for a person of ordinary skill in the art we adopt.

Further, according to Petitioner, a person of ordinary skill in the art would have had “significant knowledge of soil characterization techniques and tools, the design, optimization and implementation of contaminant-removal systems components of those contaminant-removal systems, and remediation processes.” *Id.* at 9–10 (citing Ex. 1065 ¶¶ 137–211). We are not persuaded that Petitioner’s additional contention that a person of ordinary skill in the art would have had “significant knowledge” in various areas is informative, because it fails to explain what constitutes “significant knowledge” and identifies broad topics of knowledge that may extend well beyond the level of appropriate skill reflected in the asserted references and the ’141 patent.

C. Claim Construction

We apply the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b). 37 C.F.R. § 42.100(b). Under that standard, claim terms “are generally given their ordinary and customary meaning” as would have been understood by a person of ordinary skill in the art at the time of the invention. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips v. AWG Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc)). Extrinsic evidence is “less significant than the intrinsic record in determining ‘the legally operative meaning of claim language.’” *Phillips*, 415 F.3d at 1317.

For each of the means-plus-function limitations in the Challenged Claims, Petitioner identifies the alleged corresponding function and structure

provided in the Specification. Pet. 10–14. Petitioner does not otherwise identify any claim term as requiring an express construction. *Id.* at 10.

Patent Owner has not yet addressed the meaning of any claim term. In view of the issues we address below, we determine that it is not necessary to address the express interpretation of any claim term for purposes of this Decision. *See Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“[C]laim terms need only be construed ‘to the extent necessary to resolve the controversy’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

D. Alleged Obviousness Over Olin and ITRC

Petitioner contends the subject matter of claims 1–16, 20, 21, and 25–27 of the ’141 patent would have been obvious over Olin and ITRC. Pet. 14–58. Petitioner provides a detailed explanation of its contentions in the Petition, including a clause-by-clause analysis specifying how the combination of Olin and ITRC teaches each limitation, and those contentions are supported by the testimony of Dr. Bergendahl. *Id.*; Ex. 1064 ¶¶ 212–426.

1. Summary of Olin

Olin, titled “Physical Separation (Soil Washing) for Volume Reduction of Contaminated Soils and Sediments Processes and Equipment,” is a report published by the U.S. Environmental Protection Agency. Ex. 1004. Olin states that it “provides a consolidated reference for planning-level process feasibility evaluations, intended for both technical and nontechnical staff responsible for decision making in the management or treatment of contaminated soils and sediments.” *Id.* at iii. Dr. Bergendahl provides the following overview of Olin:

Olin provides a reference guide on how soil washing techniques are implemented. Ex. 1004, 1. Olin teaches that feasibility evaluations and development of an effective physical separation treatment train require consideration of many site-specific conditions and provides a guide on how unit processes can be combined to form an overall physical separation soil washing process suitable for a particular site. Ex. 1004, 1, 57.

Olin opens with an overview of soil washing and physical separation. Ex. 1004, 2. The overview discusses the goals and associated benefits of soil washing and provides a discussion of the science behind the physical separation techniques which are commonly used in soil washing. Ex. 1004, 3–4. The overview also includes a high-level discussion of the unit processes used in typical soil washing systems. Ex. 1004, 4–5. This section also provides a robust discussion of the steps that must be undertaken to determine if soil washing is an appropriate remediation technique for a given contamination site, information on how unit operations are selected and arranged into treatment trains if it is determined that soil washing is appropriate, and the material handling, processing, and site considerations that must be taken into consideration when evaluating a site's suitability for soil washing. Ex. 1004, 10–16.

Olin follows its overview of soil washing and physical separation with a detailed discussion on the unit processes and auxiliary equipment used in typical soil washing operations. Ex. 1004, 18–56. This section includes information on operating parameters for individual pieces of equipment and offers guidance on how unit operations should be selected and the factors that should be considered in their selection. Ex. 1004, 17. Olin follows this reference guide with three exemplary treatment trains that employ the specific unit discussed. Ex. 1004, 58–60. Olin concludes with a collection of case studies where various soil washing systems have been implemented. Ex. 1004, 66–93.

Ex. 1065 ¶¶ 165–167.

2. *Summary of ITRC*

ITRC, titled “Characterization and Remediation of Soils at Closed Small Arms Firing Ranges,” was prepared by the Interstate Technology and

Regulatory Council Small Arms Firing Range Team and provides guidance “designed to display a logical and easy-to-follow decision diagram for determining how best to remediate lead and lead-contaminated soils at closed small arms firing ranges.” Ex. 1005, iii. Dr. Bergendahl provides the following overview of ITRC:

ITRC provides an overview of several technologies available for remediating lead contaminated soil, including soil washing/particle separation and soil stabilization. Ex. 1005, 29–37. ITRC discusses the treatability studies that must be performed prior to implementing soil washing, stabilization, and other soil remediation techniques. Ex. 1005, 47–48. ITRC also includes a more in-depth discussion on soil washing and soil stabilization technologies, the technical considerations and concerns associated with each, and compares the costs, long-term liability, land use restrictions, and public perceptions of these technologies. Ex. 1005, 49–65. ITRC includes an appendix of case studies on soil washing remediation projects. Ex. 1005, App. A.

Ex. 1065 ¶ 173.

3. *Independent Claim 1*

Petitioner contends that each limitation of claim 1 is taught by the combination of Olin and ITRC and that a person of ordinary skill in the art would have been motivated to combine the references as asserted. Pet. 14–40. As noted above, Patent Owner did not file a preliminary response, and we have not been directed to any contrary evidence in the record before us. We briefly summarize Petitioner’s contentions with regard to claim 1 below.

A system for removing contaminants from contaminated soil at a site, comprising:

Petitioner contends Olin “describes three exemplary soil washing systems,” as well as performing a feasibility analysis at the site to design the treatment system, corresponding to a “system for removing contaminants

from contaminated soil,” as recited in the preamble of claim 1. Pet. 18– (citing Ex. 1004, 4, 12, 14, 59–60, Figs. 1-3, 3-1, 3-2, 3-3; Ex. 1065 ¶¶ 223–226, 228–233).

a soil diagnostic testing and sampling facility comprising:
means for extracting a representative sample of the
contaminated soil from the site;
means for segregating the sample into a plurality of size
fractions according to particle size without any testing
for contaminants being made;
means for segregating each of the size fractions into a
plurality of density fractions according to particle
density prior to testing for contaminants; and
means for testing the plurality of density fractions to
identify contaminated fractions containing the
presence of unacceptable levels of contaminants
representing at least a portion of the total contaminant
amount of the sample; and

Petitioner contends Olin teaches a feasibility evaluation process “to determine the feasibility of soil washing and the processes that will be most effective at achieving remediation,” including “‘pilot scale’ on-site testing,” with “‘separation involving sieves, hydrocyclones, and spiral density separators,’” corresponding to a “soil diagnostic testing and sampling facility.” Pet. 21–23 (citing Ex. 1004, 10, 12–16, 58, Fig. 1-3; Ex 1065 ¶¶ 228, 230–233). With regard to the recited “means for extracting a representative sample,” Petitioner contends Olin teaches the importance of a “sampling plan” representative of “the material found at the site,” and the use of conventional land moving equipment, including a front-end loader and a conveyor. *Id.* at 23–24 (citing Ex. 1004, 14–15, 19, 89–90; Ex. 1065 ¶¶ 236–237).

Petitioner further argues that ITRC teaches the use of dump trucks and conveyors to transport soil for remediation, and that it would have been

obvious “to use this well-known equipment for the known purpose of extracting representative soil sample, a crucial, standard soil washing step, because it would be a combination of known techniques that would yield predictable results.” *Id.* at 24 (citing Ex. 1004, 56; Ex. 1005, 28, A-9; Ex. 1065 ¶¶ 242–246).

With regard to segregating based on particle size and density prior to testing, Petitioner contends that Olin teaches material characterization by the “Fingerprint Method” using sequential hydrocyclone separation and gravity separation to determine the “distribution of contaminants across all the various size and density fractions,” as well that sieves may “be used at the pilot scale for on-site diagnostic separations.” *Id.* at 25 (citing Ex. 1004, 14, 16). Petitioner argues that a person of ordinary skill in the art “would have substituted the hydrocyclone taught by Olin with a wet sieve because doing so would require no more than a known substitution of prior art elements and the substitution would yield predictable results because hydrocyclones and wet sieves perform the same function – size-separating soil particles.” *Id.* at 25–26 (citing Ex. 1065 ¶ 255). Petitioner also asserts that “[i]t would have been obvious use the known elutriators and jigs (and/or other density segregating equipment), known in the art to perform the density separations in the Fingerprint Method to characterize contaminated soil because each unit was well-known.” *Id.* at 26–27 (citing Ex. 1004, 5; Ex. 1005, A-2; Ex. 1065 ¶¶ 228–232, 259–262).

With regard to testing the plurality of density fractions to identify contaminated fractions, Petitioner argues that Olin teaches using the Fingerprint Method to determine the “distribution of contaminants across all the various size and density fractions” as well as using “kits including ‘x-ray

fluorescence (XRF) for metals [and] field gas chromatography (GC) for organics” for “field analytical support.” *Id.* at 27–28 (citing Ex. 1004, 10, 13; Ex. 1065 ¶¶ 266–267).

a contaminated soil removing facility adapted for removing soil fractions from the contaminated soil at the site corresponding to the contaminated fractions from the sample as identified by the soil diagnostic testing and sampling facility, said contaminated soil removing facility further comprising:

means for extracting the contaminated soil from the site;

means for isolating soil fractions from the contaminated soil at the site corresponding to the identified contaminated density fractions from the sample;

means for processing the isolated soil fractions to remove the contaminants therefrom;

means for treating the processed soil fractions from the site corresponding to the identified contaminated fractions with at least one stabilization reagent formulated for inhibiting the solubility of metal contaminants remaining in the processed soil; and

means for returning the treated soil fractions to the site.

Petitioner contends Olin describes three exemplary contaminant removal systems, including extracting soil “using conventional land-based equipment,” the use of a hydrocyclone for size separation and then a spiral concentrator for density separation, as well as the use of screens and sieves for size separation and mineral jigs, multi-gravity separators shaking tables and pinched sluices for density separation, corresponding to the recited “soil removing facility,” “means for extracting,” and “means for isolating” limitations. *Id.* at 28–32 (citing, e.g., Ex. 1004, 5–6, 10, 14, 31–41, 56, 59–61, 90, Figs. 3-1, 3-2, 3-3). With regard to “means for processing,” Petitioner contends that Olin teaches soil washing whereby “still-contaminated fractions are treated in the solid/liquid process and in the

solids dewatering processes,” as well as that “‘chemical, biological, and thermal processes should also be considered as . . . compliments to’ soil washing technologies.” *Id.* at 33–36 (citing Ex. 1004, 4–5, 7, 13, 59, 61–62, 83–84).

With regard to treating processed soil fractions “with at least one stabilization reagent,” Petitioner argues that Olin teaches stabilization, but “does not expressly disclose the reagents and structure used in stabilization.” *Id.* at 36–37 (citing Ex. 1004, 7). Petitioner contends that “ITRC teaches that contaminated soil can be remediated with stabilization reagents and that stabilization reagents are used to ‘control the solubility of metals in [] soil for groundwater protection,[’]” as well as “that stabilization is performed by mixing contaminated soil and the reagent in ‘pug mills and specialized mixing equipment’ to achieve a ‘homogenous mix between the impacted soil and the stabilization agent.’” *Id.* at 37–38 (citing Ex. 1005, 31, 53). Petitioner reasons that “combining the well-known pug mill and stabilization reagent taught by ITRC to perform stabilization with Olin’s soil washing system would have used known methods.” *Id.* at 38–39 (citing Ex. 1004, 7; Ex. 1065 ¶ 301). Lastly, Petitioner contends that Olin and ITRC both teach that soil can be hauled by trucks after treatment for beneficial use at the site, corresponding to the recited “means for returning the treated soil fractions to the site.” *Id.* at 39–40 (citing Ex. 1004, 56; Ex. 1005, A-20, A-31).

In support of the asserted combination, according to Petitioner, Olin and ITRC both teach “same physical separation techniques, in the same sequence, using the same well-known equipment for soil washing,” both “recognize variation in contamination sites and describe designing and operating soil washing systems based on site-specific parameters.” Pet. 14–16 (citing, e.g., Ex. 1004, 3–6, 11–16, 23–56, 58, 62; Ex. 1005, 30, 47–48;

Ex. 1065 ¶¶ 214–217). Petitioner argues that “[b]ecause both Olin and ITRC contemplate using soil washing systems in combination with secondary treatment processes, it would have also been obvious to use additional secondary or tertiary remediation technologies because doing so would involve combining known processes and equipment to achieve predictable results,” and that there would have been “a reasonable likelihood of success because it was routine and well within a [person of ordinary skill in the art’s] skill level.” *Id.* at 17 (citing Ex. 1004, 13; Ex. 1005, 49; Ex. 1065 ¶ 219).

Based on our review of the evidence and arguments cited by Petitioner, we find, on this record, Petitioner sufficiently shows how it contends the asserted combination of Olin and ITRC teaches every limitation of claim 1, and why one of ordinary skill in the art would have had sufficient reason to combine Olin and ITRC, with a reasonable expectation of success in doing so, to support institution.

4. *Dependent Claims 2–16*

Petitioner contends that claims 2–16, which depend from claim 1, would have been obvious over Olin and ITRC. Pet. 40–57. We have reviewed the evidence and argument presented in the Petition, including relevant portions of the Bergendahl Declaration, and determine, on this record, Petitioner sufficiently shows how it contends the asserted combination of Olin and ITRC teaches every limitation of claims 2–16, and why one of ordinary skill in the art would have had sufficient reason to combine Olin and ITRC, with a reasonable expectation of success in doing so, to support institution. *See id.*; Ex. 1065 ¶¶ 312–387.

5. *Independent Claim 20 and Dependent Claims 21 and 25–27*

Petitioner contends that claims 20, 21, and 25–27 would have been obvious over Olin and ITRC for substantially the same reasons Petitioner identifies with regard to corresponding limitations in claims 1 and 13–16. Pet. 57–58. For the reasons explained above in our analysis of claim 1, and based on our review and consideration of Petitioner’s arguments and evidence directed to claims 20, 21, and 25–27, we determine, on this record, Petitioner sufficiently shows how it contends the asserted combination of Olin and ITRC teaches every limitation of claims 20, 21, and 25–27, and why one of ordinary skill in the art would have had sufficient reason to combine Olin and ITRC, with a reasonable expectation of success in doing so, to support institution.

6. *Determination of a Reasonable Likelihood of Prevailing*

“Once all relevant facts are found, the ultimate legal determination [of obviousness] involves the weighing of the fact findings to conclude whether the claimed combination would have been obvious to an ordinary artisan.” *Arctic Cat*, 876 F.3d at 1361. On balance, considering the record presently before us, Petitioner has established a reasonable likelihood that it would prevail in showing that the combination of Olin and ITRC would have rendered the subject matter of claims 1–16, 20, 21, and 25–27 of the ’141 patent obvious to one of ordinary skill in the art at the time of the invention.

*E. Additional Grounds*⁹

Petitioner contends that the subject matter of claims 17–19 and 22–24 would have been obvious over Olin, ITRC, and Conca. Pet. 58–62. These claims include additional limitations generally directed to the use of a stabilization reagent. Ex. 1001, 28:40–49, 30:3–12. Petitioner generally argues Conca teaches the use of “a reactive phosphate mineral apatite as a stabilizing reagent,” and that a person of ordinary skill in the art would have had reason to add “a secondary treatment like the stabilization treatment taught by Conca to the Olin/ITRC system because both Olin and ITRC discuss the use of secondary treatment processes in soil washing,” and “secondary remediation techniques would remediate any contaminated fractions according to that secondary process.” Pet. 59–60; *see also id.* at 59–61 (arguing that a person of ordinary skill in the art “would have a reasonable likelihood of success in combining the teachings of Olin, ITRC, and Conca, because, as taught by Olin and ITRC, the systems were known and the combination required no more than ordinary skill”). Petitioner’s contentions are supported by the testimony of Dr. Bergendahl. Ex. 1065 ¶¶ 427–451.

Petitioner also contends that the subject matter of claims 1–11 and 13–27 would have been obvious over BDM, 1998, Bovendeur, and Conca. Pet. 62–94. Petitioner reasons that a person of ordinary skill in the art would have sufficient reason to combine the teachings of BDM, 1998,

⁹ Dr. Bergendahl addresses the unpatentability of claim 12 based on various other references (*see* Ex. 1065 ¶¶ 685–701); however, the Petition contains no corresponding contentions based on these opinions. As such, the only challenge to claim 12 at issue in this proceeding is alleged obviousness over Olin and ITRC.

Bovendeur, and Conca, including that the asserted combination simply arranges old elements performing the same known function to yield predictable results. *Id.* at 62–66. Petitioner’s contentions are supported by the testimony of Dr. Bergendahl. Ex. 1065 ¶¶ 452–684.

Because we have determined above that, at this stage of the proceeding and on the present record, the information presented in the Petition shows that there is a reasonable likelihood that Petitioner would prevail with respect to at least one claim challenged based on alleged obviousness over Olin and ITRC, we need not address, in this Decision, Petitioner’s additional grounds of unpatentability. *See* 35 U.S.C. § 314(a).

IV. CONCLUSION

For the foregoing reasons, we determine that Petitioner demonstrates a reasonable likelihood of prevailing with respect to at least one of the claims challenged in the Petition. Accordingly, *inter partes* review of the ’141 patent shall proceed in this case on all of the grounds raised in the Petition. *See SAS Inst.*, 138 S. Ct. at 1359–60 (holding that a decision to institute under 35 U.S.C. § 314 may not institute on fewer than all claims challenged in the petition); *PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (stating that the decision whether to institute *inter partes* review requires “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

Our determination in this Decision is not a final determination on either the patentability of any challenged claims or the construction of any claim term. The factual findings set forth in this Decision are preliminary and provided for the sole purpose of deciding whether to institute a review. Any final findings will be based on the full trial record, including any information presented by Patent Owner in a timely filed response to the

Petition. *See Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (noting that “there is a significant difference between a petitioner’s burden to establish a ‘reasonable likelihood of success’ at institution, and actually proving invalidity by a preponderance of the evidence at trial”) (quoting 35 U.S.C. § 314(a) and comparing *id.* with § 316(e)).

IV. ORDER

Upon consideration of the record before us, it is:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–27 of U.S. Patent No. 7,399,141 B2 is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of U.S. Patent No. 7,399,141 B2 shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

IPR2022-01174
Patent 7,399,141 B2

FOR PETITIONER:

Jennifer Hayes
Juliet DeFrancisco
NIXON PEABODY LLP
jenhayes@nixonpeabody.com
jdefrancisco@nixonpeabody.com

FOR PATENT OWNER:

Mark P. Walters
Lawrence D. Graham
LOWE GRAHAM JONES PLLC
walters@lowegrahamjones.com
graham@lowegrahamjones.com