

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
 Stylesheet Version v1.2

EPAS ID: PAT4789378

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT	
<b>NATURE OF CONVEYANCE:</b>	AMENDED AND RESTATED PATENT SECURITY AGREEMENT	
<b>CONVEYING PARTY DATA</b>		
<b>Name</b>		<b>Execution Date</b>
SUPERIOR SILICA SANDS LLC		01/05/2018
<b>RECEIVING PARTY DATA</b>		
<b>Name:</b>	PNC BANK, NATIONAL ASSOCIATION	
<b>Street Address:</b>	2100 ROSS AVENUE, SUITE 1850	
<b>City:</b>	DALLAS	
<b>State/Country:</b>	TEXAS	
<b>Postal Code:</b>	75201	
<b>PROPERTY NUMBERS Total: 15</b>		
<b>Property Type</b>	<b>Number</b>	
Patent Number:	7726070	
Patent Number:	8196346	
Patent Number:	8341881	
Patent Number:	8453377	
Patent Number:	8510986	
Patent Number:	8661729	
Patent Number:	8739464	
Patent Number:	8881453	
Patent Number:	8931209	
Patent Number:	8931210	
Patent Number:	9057014	
Application Number:	14171920	
Application Number:	14293555	
Application Number:	14594396	
Application Number:	15416950	
<b>CORRESPONDENCE DATA</b>		
<b>Fax Number:</b>	(617)523-6850	
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i>		
<b>Phone:</b>	617-523-2700	

PATENT

**Email:** susan.dinicola@hklaw.com,hunter.hullett@hklaw.com  
**Correspondent Name:** HOLLAND & KNIGHT LLP  
**Address Line 1:** 10 ST. JAMES AVENUE  
**Address Line 4:** BOSTON, MASSACHUSETTS 02116

**ATTORNEY DOCKET NUMBER:** 057833.00093

**NAME OF SUBMITTER:** SUSAN C. DINICOLA

**SIGNATURE:** /Susan C. DiNicola/

**DATE SIGNED:** 01/23/2018

**Total Attachments: 7**

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AMENDED AND RESTATED  
PATENT SECURITY AGREEMENT

This Amended and Restated Patent Security Agreement (this “Patent Security Agreement”) is made as of this 5<sup>th</sup> day of January, 2018, between the Grantor listed on the signature page hereof (“Grantor”), and PNC BANK, NATIONAL ASSOCIATION, in its capacity as administrative and collateral agent for the Lenders (together with its successors and assigns in such capacity, “Agent”).

WHEREAS, pursuant to that certain Second Amended and Restated Revolving Credit and Security Agreement dated as of January 5, 2018 (as may be further amended, restated, supplemented or otherwise modified from time to time, including all exhibits and schedules thereto, the “Credit Agreement”) among Grantor and its affiliates from time to time party thereto, the lenders which are now or which hereafter become a party thereto (the “Lenders”), and Agent, the Lenders agreed to make certain financial accommodations available to Borrowers from time to time pursuant to the terms and conditions thereof;

WHEREAS, pursuant to the Credit Agreement, Grantor is required to execute and deliver to Agent, for the benefit of the Lenders, this Patent Security Agreement.

NOW, THEREFORE, in consideration of the premises and mutual covenants herein contained and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Grantor hereby agrees as follows:

1. DEFINED TERMS. All capitalized terms used but not otherwise defined herein have the meanings given to them in the Credit Agreement.

2. GRANT OF SECURITY INTEREST IN PATENT COLLATERAL. Grantor hereby assigns, pledges and grants to Agent, for its benefit and the benefit of the Lenders, a continuing first priority security interest, subject only to Permitted Encumbrances, in all of Grantor’s right, title and interest in, to and under the following, whether now owned or existing or hereafter acquired or arising (collectively, the “Patent Collateral”):

**(a) ALL OF GRANTOR’S UNITED STATES AND FOREIGN PATENTS AND PATENT APPLICATIONS, AND ALL REISSUES, RE-EXAMINATIONS, DIVISIONS, RENEWALS, EXTENSIONS, CONTINUATIONS, AND CONTINUATIONS-IN-PART (COLLECTIVELY, “PATENTS”), AND LICENSES FOR ANY OF THE FOREGOING (“LICENSES”), INCLUDING THOSE REFERRED TO ON SCHEDULE I HERETO;**

**(b) ALL RIGHTS AND PRIVILEGES ARISING UNDER APPLICABLE LAW WITH RESPECT TO THE GRANTOR’S RIGHTS IN ANY OF THE PATENTS OR LICENSES;**

**(c) ALL INVENTIONS, DISCOVERIES, DESIGNS AND IMPROVEMENTS DESCRIBED OR CLAIMED IN THE PATENTS;**

**(d) ALL INCOME, FEES, ROYALTIES, DAMAGES, CLAIMS AND PAYMENTS NOW OR HEREAFTER DUE AND/OR PAYABLE UNDER ANY OF THE PATENTS OR LICENSES, INCLUDING DAMAGES AND PAYMENTS FOR PAST, PRESENT AND FUTURE INFRINGEMENTS, VIOLATIONS OR IMPAIRMENTS THEREOF;**

**(e) ALL RIGHTS CORRESPONDING TO THE PATENTS OR LICENSES THROUGHOUT THE WORLD; AND**

**(f) ALL RIGHTS TO SUE FOR PAST, PRESENT OR FUTURE INFRINGEMENTS, VIOLATION OR IMPAIRMENT OF THE PATENTS OR LICENSES THEREOF.**

Notwithstanding the foregoing, the Patent Collateral shall exclude the Excluded Collateral.

3. SECURITY FOR OBLIGATIONS. This Patent Security Agreement and the security interest created hereby secure the payment and performance of all the Obligations, whether now existing or arising hereafter. Without limiting the generality of the foregoing, this Patent Security Agreement secures the payment of all amounts which constitute part of the Obligations and would be owed by Grantor to Agent, the Lenders or any of them, whether or not they are unenforceable or not allowable due to the existence of an insolvency proceeding involving Grantor.

4. CREDIT AGREEMENT. The security interests granted pursuant to this Patent Security Agreement are granted in conjunction with the security interests granted to Agent, for the benefit of the Lenders, pursuant to the Credit Agreement. Grantor hereby acknowledges and affirms that the rights and remedies of Agent with respect to the security interest in the Patent Collateral made and granted hereby are more fully set forth in the Credit Agreement, the terms and provisions of which are incorporated by reference herein as if fully set forth herein.

5. AUTHORIZATION TO SUPPLEMENT. If Grantor shall obtain rights to any new Patent Collateral, this Patent Security Agreement shall automatically apply thereto. In accordance with Sections 6.6(a) and 9.3 of the Credit Agreement, Grantor shall give notice in writing to Agent with respect to any such new Patent Collateral. Without limiting Grantor's obligations under this Section 5, Grantor hereby authorizes Agent unilaterally to modify or supplement this Patent Security Agreement by amending Schedule I to include any such new Patent Collateral of Grantor. Notwithstanding the foregoing, no failure to so modify this Patent Security Agreement or amend Schedule I shall in any way affect, invalidate or detract from Agent's continuing security interest in all Collateral, whether or not listed on Schedule I.

6. COUNTERPARTS. This Patent Security Agreement may be executed in any number of counterparts, each of which shall be deemed to be an original, but all such separate counterparts shall together constitute but one and the same instrument. In proving this Patent Security Agreement or any Other Document in any judicial proceedings, it shall not be necessary to produce or account for more than one such counterpart signed by the party against whom such enforcement is sought. Any signatures delivered by a party by facsimile transmission or by email transmission shall be deemed an original signature hereto.

7. CONSTRUCTION. The following rules of construction shall apply in this Patent Security Agreement:

(a) The terms “herein,” “hereof” and “hereunder” and other words of similar import refer to this Patent Security Agreement as a whole and not to any particular section, paragraph or subdivision.

(b) All references herein to Articles, Sections, Exhibits and Schedules shall be construed to refer to Articles and Sections of, and Exhibits and Schedules to, this Patent Security Agreement.

(c) Any pronoun used shall be deemed to cover all genders.

(d) Wherever appropriate in the context, terms used herein in the singular also include the plural and vice versa.

(e) All references to Laws shall include any amendments of same and any successor Laws.

(f) Unless otherwise provided, all references to any instruments or agreements, including references to this Patent Security Agreement or any of the Other Documents, shall include any and all modifications or amendments thereto, and any and all restatements, amendment and restatements, extensions or renewals thereof, in each case, in accordance therewith and herewith.

(g) Whenever the words “including” or “include” shall be used, such words shall be understood to mean “including, without limitation” or “include, without limitation”.

8. GOVERNING LAW. This Patent Security Agreement and the transaction contemplated hereby, and all disputes between the parties under or relating to this Patent Security Agreement or the facts or circumstances leading to its execution, whether in contract, tort or otherwise, shall be construed in accordance with and governed by the laws (including statutes of limitation) of the State of New York, without regard to conflicts of law principles that would require the application of the laws of another jurisdiction.

9. AMENDMENT AND RESTATEMENT. This Patent Security Agreement amends and restates (but does not constitute an extinguishment or novation of) that certain Patent Security Agreement dated April 29, 2016 by the Grantor listed therein in favor of Agent for the Lenders.

*[Remainder of page intentionally left blank; signature page follows.]*

IN WITNESS WHEREOF, Grantor has caused this Patent Security Agreement to be executed and delivered by its duly authorized officer as of the date first set forth above.

GRANTOR:

SUPERIOR SILICA SANDS LLC,  
a Texas limited liability company

By: \_\_\_\_\_



Name: Warren B. Bonham

Title: Vice President

[Signature Page]

Amended and Restated Patent Security Agreement

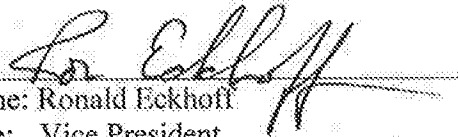
**PATENT**

**REEL: 045127 FRAME: 0224**

ACCEPTED AND  
ACKNOWLEDGED BY:

PNC BANK, NATIONAL ASSOCIATION,  
solely in its capacity as Agent and not in its  
individual capacity

By:

  
Name: Ronald Eckhoff  
Title: Vice President

[Signature Page]

Amended and Restated Patent Security Agreement

**PATENT**  
**REEL: 045127 FRAME: 0225**

**SCHEDULE I**  
**TO**  
**PATENT SECURITY AGREEMENT**

**Patents**

<u>Patent. No</u>	<u>Issued</u>	<u>Title</u>
U.S. 7,726,070	June 1, 2010	HYDRATION MAINTENANCE APPARATUS AND METHOD
U.S. 8,196,346	June 12, 2012	DELAYED-ACTIVATION, HYDRATION MAINTENANCE APPARATUS AND METHOD
U.S. 8,341,881	January 1, 2013	HYDRATION MAINTENANCE APPARATUS AND METHOD
U.S. 8,453,377	June 4, 2013	PLAYING-FIELD, SOIL TREATMENT APPARATUS AND METHOD
U.S. 8,510,986	August 20, 2013	HYDRATION MAINTENANCE APPARATUS AND METHOD
U.S. 8,661,729	March 4, 2014	HYDRAULIC FRACTURE COMPOSITION AND METHOD
U.S. 8,739,464	June 3, 2014	DELAYED-ACTIVATION, HYDRATION MAINTENANCE APPARATUS AND METHOD
U.S. 8,881,453	November 11, 2014	SEED-BORNE SOIL AMENDMENT METHOD AND COMPOSITION
U.S. 8,931,209	January 13, 2015	SEED-DELIVERED, SOIL-AMENDMENT METHOD AND COMPOSITION
U.S. 8,931,210	January 13, 2015	HYDRATION MAINTENANCE APPARATUS AND METHOD
U.S. 9,057,014	June 16, 2015	HYDRAULIC FRACTURE COMPOSITION AND METHOD

<u>Publication No.</u>	<u>Filed</u>	<u>Title</u>
2014/0243246	February 4, 2014	HYDRAULIC FRACTURE COMPOSITION AND METHOD
2014/0298722	June 2, 2014	DELAYED-ACTIVATION, HYDRATION MAINTENANCE APPARATUS AND METHOD
2015/0121751	January 12, 2015	SEED DELIVERED, SOIL AMENDMENT METHOD AND COMPOSITION (Abandoned)
2015/0143746	January 12, 2015	HYDRATION MAINTENANCE APPARATUS AND METHOD



2017/0137703

January 26, 2017

HYDRAULIC FRACTURE COMPOSITION AND  
METHOD

CA2956408A1

January 27, 2017

HYDRAULIC FRACTURE COMPOSITION AND  
METHOD (Canadian Patent)

**Licenses**

N/A