

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
Stylesheet Version v1.2

EPAS ID: PAT4941179

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT
<b>NATURE OF CONVEYANCE:</b>	ASSIGNMENT
<b>CONVEYING PARTY DATA</b>	
<b>Name</b>	<b>Execution Date</b>
ARAMCO SERVICES COMPANY	10/01/2016
<b>RECEIVING PARTY DATA</b>	
<b>Name:</b>	SAUDI ARABIAN OIL COMPANY
<b>Street Address:</b>	1 EASTERN AVENUE
<b>City:</b>	DHAHRAN
<b>State/Country:</b>	SAUDI ARABIA
<b>Postal Code:</b>	31311
<b>PROPERTY NUMBERS Total: 1</b>	
<b>Property Type</b>	<b>Number</b>
<b>Application Number:</b>	15968248
<b>CORRESPONDENCE DATA</b>	
<b>Fax Number:</b>	(800)404-3970
<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>Email:</b>	docketing@bracewell.com
<b>Correspondent Name:</b>	BRACEWELL LLP
<b>Address Line 1:</b>	PO BOX 61389
<b>Address Line 4:</b>	HOUSTON, TEXAS 77208-1389
<b>ATTORNEY DOCKET NUMBER:</b>	0004159.005926
<b>NAME OF SUBMITTER:</b>	BRIAN H. TOMPKINS
<b>SIGNATURE:</b>	/Brian H. Tompkins/
<b>DATE SIGNED:</b>	05/01/2018
<b>Total Attachments: 5</b>	
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**INTELLECTUAL PROPERTY ASSIGNMENT  
FROM ARAMCO SERVICES COMPANY  
TO SAUDI ARABIAN OIL COMPANY**

This Intellectual Property Assignment ("Assignment"), dated as of October 1, 2016, is made by Aramco Services Company, a Delaware corporation, having offices at 9009 West Loop South, Houston, Texas 77096-1719 ("Assignor"), in favor of Saudi Arabian Oil Company, a company with limited liability, duly organized and existing under the laws of the Kingdom of Saudi Arabia and established by Royal Decree M/8 dated 4/4/1409 H. ("Assignee") together recognized as "Parties".

RECITALS

WHEREAS, the parties previously executed an Intellectual Property Assignment, dated as of April 13, 2015, in which the Parties agreed that Assignor shall continue to assign intellectual property to Assignee on a quarterly basis; and

WHEREAS, Assignor is the present owner of the rights, title and interest in the invention disclosures, patents and patent applications set forth in the attached Schedule A (the "**Intellectual Property**") as of October 1, 2016;

NOW, for good and valuable consideration, the receipt and sufficiency of which is acknowledged, the Parties agree as follows:

1. Assignment of Intellectual Property. Assignor assigns to Assignee all of its rights, title and interest in and to the Intellectual Property, including, but not limited to:

(a) the right to make, use and sell the inventions associated with the Intellectual Property;

(b) the right to take all legal actions on account of past, present and future infringement of the Intellectual Property;

(c) the right to conduct and control all protection activities associated with the Intellectual Property as fully and entirely as the same would have been held and enjoyed by Assignor if this assignment had not been made, including for example: the filing and prosecution of any and all patent applications, including divisions, continuations, and continuations-in-part of existing applications assigned by this Assignment; reexaminations, reissues or other administrative proceedings; and the payment of issuance and maintenance fees; and

(d) any and all rights and obligations held by the Assignor arising under the Assignment in relation to the Intellectual Property.

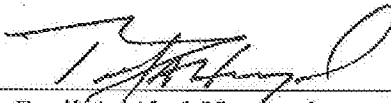
2. Further Assurances. Assignor hereby covenants and agrees that it will at any time, upon the request and at the expense of Assignee but without further compensation, cooperate with Assignee in the protection of the Intellectual Property, including: all lawful acts that may be necessary to perfect the title to the Intellectual Property, such as the execution and delivery of

formal documents; cooperate with Assignee in the enforcement or licensing of the Intellectual Property, including in any interference, reexamination, or other litigation; communicate to Assignee, its successors and assigns, any facts known respecting the Intellectual Property and its history, and generally do everything possible which the Assignee shall consider desirable for vesting title to improvements in the Intellectual Property.

3. Warranties. Assignor hereby warrants that no assignment, grant, mortgage, license or other agreement affecting the rights and property herein conveyed has been or will be made to others by the Assignor, and that the full right to convey the same as herein expressed is possessed by the Assignor, to the extent set forth in Schedule A.

IN WITNESS WHEREOF, the Parties have executed this Assignment as of October 1, 2016.

**ARAMCO SERVICES COMPANY**

By:   
Basil A. Abul-Hamayel  
President

**SAUDI ARABIAN OIL COMPANY**

By:   
Ahmad Khowaiter  
Chief Technology Officer

Schedule A - Quarterly Assignment - February 15, 2018

Title	ASC Docket Number	SAO Docket Number	Application Date	Application Number	Inventors
Method of Encapsulating Signaling Agents for Use Downhole	ASC0053	SA5631	NA	NA	Elizabeth Q. Contreras,
Measuring Source Rock Potential Using a Quantum Electronic Scanner	ASC0085	SA7333	22-Dec-17	15/852,324	Sebastian Csutak
Measuring Source Rock Potential Using Terahertz Analysis	ASC0086	SA7338	22-Dec-17	15/852,387	Sebastian Csutak
Collaborative Sensing and Prediction of Source Rock Properties	ASC0087	SA5502	NA	NA	Sebastian Csutak, David Jacobi, Max Deffenbaugh, Tiffany Dawn Mcalpin, Shanno Lee Eichmann
Compositions and Methods for Sealing Off Flow Channels in Contact With Set Cement	ASC0106	SA7181	1-Nov-17	15/800,926	BR Reddy, Matthew Hilfiger
Detecting a Multi-Modal Tracer in a Hydrocarbon Reservoir	ASC0109	SA7153	11-Dec-17	15/822,546	Jason R Cox, Martin E. Poltzsch, Shannon L. Eichmann, Wei Wang, Hooisweng Ow, Sehoon Chang, Rena Shi, David Robert Jung, Ayrat Gizratov, Mohammad Hamidul Haque, Anthony Andrew Kmetz, Il, Hsieh Chen
Crosslinked Polymeric Blended Membranes for Gas Separation	ASC0112	SA6139	5-Dec-17	PCT/US2017/064664	Junyan Yang, Daniel Harrigan
Controlling Gel Times of Remedial Aqueous Resin Compositions for Sealing Off Flow Channels	ASC0148	SA7182	1-Nov-17	15/800,842	B. Raghava Reddy, Matthew Hilfiger
Virtual Source Redatuming Using Radiation Pattern Correction	ASC0149	SA7189	NA	NA	Yanh Zhao, Roy Matthew Burnstad, Weichang Li
Water-Based Sealing Compositions with Aminosilane Crosslinkers	ASC0150	SA7183	1-Nov-17	15/800,933	B. Raghava Reddy, Matthew Hilfiger
Settable, Form-Filling Loss Circulation Control Compositions Comprising in Situ Foamed Non-Hydraulic Sorel Cement Systems and Method of Use	ASC0152	SA7419	24-Jan-18	15/879,169	B. Raghava Reddy
Use of Wavelet Cross-Correlation for Virtual Source Denoising	ASC0161	SA7218	10-Nov-17	15/809,744	Yang Zhao, Weichang Li
N-Hydroxyalkylated Polyamines, Methods of Making N-Hydroxyalkylated Polyamines, and Fluids Containing an N-Hydroxyalkylated Polyamine	ASC0163	SA6160	3-Jan-18	15/860,831	B. Raghava Reddy, Matthew Hilfiger
High Spatial Resolution Nuclear Magnetic Resonance Logging	ASC0171/ ASC0261	SA7089/ SA7339	17-Jan-18	15/873,576	Jin-Hong Chen, Stacey M. Althaus, Mohammad Delshad, Yang Zhao

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Real-time Monitoring of Hydrocarbon Productions	ASC0177	SA7332	3-Jan-18	15/861,400	Anthony Andrew Kmetz, H. Vinay Raman, Jason R. Cox
Enhanced High Temperature Crosslinked Fracturing Fluids	ASC0178	SA7285	29-Aug-17	62/551,369	Leiming Li, Feng Liang
Enhancing Reservoir Production Optimization Through Integrating Inter-Well Tracers	ASC0194	SA7347	17-Oct-17	15/786,372	Hsieh Chen, Martin Poltsch
Oil-Swellable, Surface-Treated Elastomeric Polymer and Methods of Using the Same for Controlling Losses of Non-Aqueous Wellbore Treatment Fluids to the Subterranean Formation	ASC0199	SA5684	1-Dec-17	15/829,520	B. Raghava Reddy
Composition of Encapsulated Chemical Additives and Methods for Preparation of the Same	ASC0202	SA5709	2-Jan-18	62/612,756	Elizabeth Q. Contreras, B. Raghava Reddy
Synthetic Source Rocks	ASC0203	SA7293	2-May-17	62/500,282	Mohammad Hamdul Haque, Younane N. Abousleiman, Katherine L. Hull, David Jacobi, Yanhui Han
Mitigation of Sand Production in Sandstone Reservoir Using Thermally Expandable Beads	ASC0206	SA5713	11-Sep-17	15/701,140	Yanhui Han, Feng Liang, Mohammad H. Haque
Mitigation of Condensate Banking Using Surface Modification	ASC0229	SA2057	20-Jul-17	62/534,927	Mohammed Sayed, Feng Liang, Hooisweng Ow, Jason Cox
Methods and Systems for Characterization of Geochemical Properties of Liquid Hydrocarbons Using Microwaves	ASC0239	SA5734	20-Jul-17	62/535,053	Jose Oliverio Alvarez
Algorithm for Cost Effective Thermodynamic Fluid Property Predictions Using Machine-Learning Based Models	ASC0240	SA7334	26-Sep-17	62/563,460	Abishek Kashinath
Machine-Learning-Based Models for Phase Equilibria Calculations in Compositional Reservoir Simulations	ASC0245	SA7352	25-Jan-18	15/879,793	Vinay Raman, Todd Ferguson
Low-Density Gels and Composites for Protecting Underground Electric Components from Chemical Damage	ASC0253	SA7306	2-Jun-17	62/514,067	Ghanem H. Al-Zorai, Weishu Zhao, Jin Huang, Fuken Frank Chang, Feng Liang, Rajendra Arunkumar Kaigaonkar
Estimating Geological Dip Based on Seismic Data	ASC0254	SA7330	22-Sep-17	62,561,846	Hyungsu Baek
Additive Manufacture of Cementitious Materials in a Wellbore	ASC0260	SA5738	5-Dec-17	62/594,676	Peter Boul, Carl Thaeumitz
Fracturing Fluids Comprising Alkanolamine Borates as Crosslinkers for Polysaccharides	ASC0262	SA5765	16-Oct-17	15/784,755	BR Reddy, Feng Liang, Leiming Li
Treatment of Kerogen in Subterranean Zones	ASC0263	SA7365	10-Jan-18	15/866,933	Katherinel. Hull, Younane N. Abousleiman, David Jacobi

Settable, Form-Filling Loss Circulation Control Compositions Comprising in Situ Foamed Calcium Aluminate Cement Systems and Method of Use	ASC0272	SA7423	24-Jan-18	15/879,179	B. Raghava Reddy
Measuring a Water Out of Hydrocarbon Fluid in a Production Pipe	ASC0275	SA7422	14-Nov-17	62/585,965	Jose Oliverio Alvarez
Methods and Apparatus for Collecting and Preserving Core Samples from a Reservoir	ASC0281	SA5871	24-Oct-17	15/791,993	Anuj Gupta, Dan Georgi, Katherine Hull
High Temperature Fracturing Fluids with Nano-Crosslinkers	ASC0286	SA5851	4-Dec-17	15/830,831	Gaitham Al-Muntasheri, Feng Liang, Hoodsweng Ow, Jason Cox, Martin E. Poltsch
Nano-Level Evaluation of Kerogen-Rich Reservoir Rock	ASC0289	SA7465	10-Jan-18	15/866,634	Katherin Hull, Younane Abousleiman, Sebastian Csutak
Nano-Level Evaluation of Kerogen-Rich Reservoir Rock	IP-18-221	SA7502	NA	NA	Katherin Hull, Younane Abousleiman, Sebastian Csutak