

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
 Stylesheet Version v1.2

EPAS ID: PAT8256646

SUBMISSION TYPE:	CORRECTIVE ASSIGNMENT
NATURE OF CONVEYANCE:	Corrective Assignment to correct the PROPERTY TYPE: APPLICATION NO. previously recorded on Reel 065255 Frame 0383. Assignor(s) hereby confirms the ASSIGNMENT.

CONVEYING PARTY DATA

Name	Execution Date
ARAMCO SERVICES COMPANY	08/30/2023

RECEIVING PARTY DATA

Name:	SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY
Street Address:	P.O. BOX 62
Internal Address:	BUILDING 2297, ROOM GA-313
City:	DHAHRAN
State/Country:	SAUDI ARABIA
Postal Code:	31311

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	17157209

CORRESPONDENCE DATA**Fax Number:**

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.

Email: mclaughlin@obwbip.com
Correspondent Name: BENJAMIN MCLAUGHLIN
Address Line 1: 1100 LOUISIANA ST
Address Line 4: HOUSTON, TEXAS 77002

NAME OF SUBMITTER:	THOMAS K. SCHERER
SIGNATURE:	/Thomas K. Scherer/
DATE SIGNED:	11/02/2023

Total Attachments: 30

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PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1
Stylesheet Version v1.2

EPAS ID: PAT8225659

SUBMISSION TYPE:	NEW ASSIGNMENT
NATURE OF CONVEYANCE:	ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
ARAMCO SERVICES COMPANY	08/30/2023

RECEIVING PARTY DATA

Name:	SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY
Street Address:	P.O. BOX 62
Internal Address:	BUILDING 2297, ROOM GA-313
City:	DHAHRAN
State/Country:	SAUDI ARABIA
Postal Code:	31311

PROPERTY NUMBERS Total: 56

Property Type	Number
Application Number:	17155803
Application Number:	17141783
Application Number:	17644119
Application Number:	17644346
Application Number:	17409271
Application Number:	17038345
Application Number:	17455128
Application Number:	17644845
Application Number:	17167501
Application Number:	17155735
Application Number:	17644103
Application Number:	17157209 **17157290**
Application Number:	17648034
Application Number:	17649505
Application Number:	17647416
Application Number:	17647428
Application Number:	17490348
Application Number:	17316280
Application Number:	17724132

PATENT

Property Type	Number
Application Number:	17644450
Application Number:	17394547
Application Number:	18046351
Application Number:	17121044
Application Number:	17454539
Application Number:	17144677
Application Number:	17650804
Application Number:	17165372
Application Number:	17157340
Application Number:	17069080
Application Number:	17143583
Application Number:	17011285
Application Number:	17091402
Application Number:	16901620
Application Number:	17371736
Application Number:	17375417
Application Number:	14644832
Application Number:	17643487
Application Number:	17363326
Application Number:	18342487
Application Number:	18326986
Application Number:	18343668
Application Number:	17814170
Application Number:	18344666
Application Number:	18345113
Application Number:	17937309
Application Number:	18325777
Application Number:	17814447
Application Number:	18324857
Application Number:	63516754
Application Number:	17150142
Application Number:	17644697
Application Number:	17645330
Application Number:	17470796
Application Number:	17197696
Application Number:	17372161
Application Number:	18306013

CORRESPONDENCE DATA**Fax Number:**

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.

Email: mclaughlin@obwbip.com
Correspondent Name: BENJAMIN MCLAUGHLIN
Address Line 1: 1100 LOUISIANA ST
Address Line 4: HOUSTON, TEXAS 77002

NAME OF SUBMITTER:	SEEMA M. MEHTA
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SIGNATURE:	/Seema M. Mehta/
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DATE SIGNED:	10/17/2023
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Total Attachments: 21

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PATENT ASSIGNMENT

THIS AGREEMENT, to be effective as of _____, 2023, is by and between **ARAMCO SERVICES COMPANY**, a corporation having a place of business at 1200 Smith Street, Houston, Texas 77002, United States of America and **SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY**, a corporation having a place of business at P.O. BOX 62 Building 2297, Room GA-313 Dhahran, Saudi Arabia 31311.

WITNESSETH:

WHEREAS, **ARAMCO SERVICES COMPANY** is the owner of a 100% interest in and to the patent listed in Exhibit A attached hereto ("the Patent Rights"); and

WHEREAS, **SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY** desires to obtain, and **ARAMCO SERVICES COMPANY** is willing to assign 100% of its interest in the Patent Rights to **SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY**, the Patent Rights;

NOW, THEREFORE, for good and valuable consideration, the sufficiency and receipt of which are hereby acknowledged, the parties hereby agree as follows:

ARAMCO SERVICES COMPANY does hereby sell, assign, transfer, and set over unto **SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY** 100% of its right, title, and interest in, to, and under (i) the patent listed in Exhibit A attached hereto, (ii) all patents which may issue from such patent including any continuations, divisionals, and continuations-in-part thereof, and (iii) the inventions claimed in such patents.

IN WITNESS WHEREOF, **ARAMCO SERVICES COMPANY** and **SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY** have each caused their duly authorized representative to execute this Assignment.

ARAMCO SERVICES COMPANY

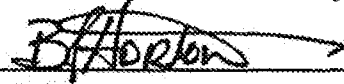
SAUDI ARAMCO UPSTREAM TECHNOLOGIES COMPANY

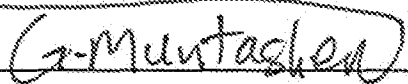
Name: Bobby Horton

Name: ^AGhaithan A. Muntasheri

Title: General Counsel & Corporate Secretary

Title: Chief Executive Officer


Signature


Signature

August 30, 2023
Date

9/13/2023
Date

EXHIBIT A

- 1. Application No.:** 17/155,803

Inventor: Yanhui Han

Assignee: ARAMCO SERVICES COMPANY

Title: METHOD FOR DETERMINING IN-SITU MAXIMUM HORIZONTAL STRESS

Filed: January 22, 2021

Attorney Docket No: 18733-282001

- 2. Application No.:** 17/141,783

Inventor: Hasmukh A. Patel

Assignee: ARAMCO SERVICES COMPANY

Title: IN-SITU POLYPHOSPHAZENE GENERATION IN CEMENT FOR IMPROVED ELASTIC PROPERTIES

Filed: January 5, 2021

Attorney Docket No: 18733-208001

- 3. Application No.:** 17/644,119

Inventors: Fakuen Frank Chang
Wenwen Li
Feng Liang

Assignee: ARAMCO SERVICES COMPANY

Title: BLOWING AGENT INCORPORATED RESIN SYSTEMS FOR CONSOLIDATING SUBTERRANEAN OIL AND GAS BEARING FORMATIONS

Filed: December 14, 2021

Attorney Docket No: 18733-457001

4. Application No.: 17/644,346
Inventor: Mohammed Ali Ibrahim Sayed
Rajesh Saini
Assignee: ARAMCO SERVICES COMPANY
Title: FOAMED WETTABILITY ALTERATION TREATMENT FOR
DEEP CONDENSATE AND WATER BLOCKAGE IN GAS
RESERVOIRS

Filed: December 15, 2021
Attorney Docket No: 18733-460001

5. Application No.: 17/409,271
Inventor: Wei Wang
Assignee: ARAMCO SERVICES COMPANY
Title: MODIFIED CARBON NANOMATERIALS AS TRACERS
FOR RESERVOIR MONITORING

Filed: August 23, 2021
Attorney Docket No: 18733-376001

6. Application No.: 17/038,345
Inventor: Hsieh Chen
Martin E. Poitzsch
Assignee: ARAMCO SERVICES COMPANY
Title: WATERFLOOD FRONT IMAGING USING
SEGMENTALLY INSULATED WELL LINERS AS ON-
DEMAND ELECTRODES

Filed: September 30, 2020
Attorney Docket No: 18733-210001

7. **Application No.:** 17/455,128
 Inventors: Jin-Hong Chen
 Stacey M. Althaus
 Houzhu Zhang

 Assignee: ARAMCO SERVICES COMPANY
 Title: METHOD AND SYSTEM FOR DETERMINING GAMMA-
 RAY MEASUREMENTS USING A SENSITIVITY MAP AND
 CONTROLLED SAMPLING MOTION

 Filed: November 16, 2021
Attorney Docket No: 18733-490001

8. **Application No.:** 17/644,845
 Inventor: Weichang Li
 Murtadha J. AlTammar
 Khalid M. Alruwaili
 Osman Hamid

 Assignee: ARAMCO SERVICES COMPANY
 Title: METHOD AND SYSTEM FOR GENERATING
 FORMATION PROPERTY VOLUME USING MACHINE
 LEARNING

 Filed: December 17, 2021
Attorney Docket No: 18733-459001

9. **Application No.:** 17/167,501
 Inventor: Mahmoud F. Abughaban
 Ashok Kumar Santra

 Assignee: ARAMCO SERVICES COMPANY
 Title: METHOD AND SYSTEM FOR DRILLING FLUID
 CONDITION MONITORING

Filed: February 4, 2021

Attorney Docket No: 18733-162001

10. Application No.: 17/155,735

Inventor: Mohammad H. Haque
Rajesh K. Saini

Assignee: ARAMCO SERVICES COMPANY

Title: DOWNHOLE COUPON HOLDER

Filed: January 22, 2021

Attorney Docket No: 18733-207001

11. Application No.: 17/644,103

Inventors: Seth Busetti

Assignee: ARAMCO SERVICES COMPANY

Title: A METHOD FOR QUADRIMODAL FAULT PREDICTION
USING STRAIN TENSOR CYCLIDES

Filed: December 14, 2021

Attorney Docket No: 18733-406001

12. Application No.: ~~17/157,209~~ ^{**17157290**}

Inventor: Mahmoud F. Abughaban
Ashok Kumar Santra

Assignee: ARAMCO SERVICES COMPANY

Title: AUTOMATED RECYCLED CLOSED-LOOP WATER
BASED DRILLING FLUID CONDITION MONITORING
SYSTEM

Filed: January 25, 2021

Attorney Docket No: 18733-178001

- 13.** **Application No.:** 17/648,034
- Inventor:** Younane N. Abousleiman
 Yanhui Han
 Chao Liu
 Dung T. Phan
- Assignee:** ARAMCO SERVICES COMPANY
- Title:** METHOD FOR THE DETERMINATION OF MUD WEIGHT
 WINDOW IN N-POROSITY N-PERMEABILITY
 FORMATIONS
- Filed:** January 14, 2022
- Attorney Docket No:** **18733-456001**
-
- 14.** **Application No.:** 17/649,505
- Inventor:** Wenwen Li
 Fakuen Frank Chang
 Feng Liang
- Assignee:** ARAMCO SERVICES COMPANY
- Title:** POROUS POLYURETHANE PARTICLE COMPOSITION
 AND METHODS THEREOF
- Filed:** January 31, 2022
- Attorney Docket No:** **18733-637001**
-
- 15.** **Application No.:** 17/647,416
- Inventors:** Ashok Santra
 Carl Thaemlitz
- Assignee:** ARAMCO SERVICES COMPANY
- Title:** SYNTHESIS AND USE OF GRAFTED GRAPHENE IN
 AQUEOUS DRILLING FLUIDS AS LOW SHEAR RATE
 VISCOSITY ENHANCER

Filed: January 7, 2022

Attorney Docket No: 18733-244001

16. Application No.: 17/647,428

Inventor: Ashok Santra
Carl Thaemlitz

Assignee: ARAMCO SERVICES COMPANY

Title: SYNTHESIS AND USE OF GRAFTED GRAPHENE IN OIL
BASED DRILLING FLUIDS AS A LOW SHEAR RATE
VISCOSITY ENHANCER

Filed: January 7, 2022

Attorney Docket No: 18733-245001

17. Application No.: 17/490,348

Inventor: Adrian Cesar Cavazos Sepulveda
Damian Pablo San Roman Alerigi
Jose Oliverio Alvarez

Assignee: ARAMCO SERVICES COMPANY

Title: IN-SITU MONITORING OF CHEMICAL FINGERPRINTS
IN OILFIELD APPLICATIONS

Filed: September 30, 2021

Attorney Docket No: 18733-534001

18. Application No.: 17/316,280

Inventor: Simone Musso

Assignee: ARAMCO SERVICES COMPANY

Title: SYSTEM AND METHOD FOR TESTING CEMENT

Filed: May 10, 2021

Attorney Docket No: 18733-079002

19. Application No.: 17/724,132
Inventors: Nicole Shimek
Assignee: ARAMCO SERVICES COMPANY
Title: ACID CORROSION INHIBITORS

Filed: April 19, 2022

Attorney Docket No: 18733-9197002

20. Application No.: 17/644,450
Inventor: Wenwen Li
Rajesh Saini
Assignee: ARAMCO SERVICES COMPANY
Title: SALT TOLERANT FRICTION REDUCER

Filed: December 15, 2021

Attorney Docket No: 18733-215002

21. Application No.: 17/394,547
Inventor: Desmond E. Schipper
Amy J. Cairns
Katherine L. Hull
Assignee: ARAMCO SERVICES COMPANY
Title: METHODS FOR DELAYING IN SITU ACID GENERATION

Filed: August 5, 2021

Attorney Docket No: 18733-9173002

22. **Application No.:** 18/046,351
 Inventor: Amy J. Cairns
 Frank F. Chang
 Mohammed Sayed
 Assignee: ARAMCO SERVICES COMPANY
 Title: METHOD TO ACCELERATE ACID REACTIVITY DURING
 RESERVOIR STIMULATION

 Filed: October 13, 2022
Attorney Docket No: 18733-375002
23. **Application No.:** 17/121,044
 Inventors: Daniele Colombo
 Weichang Li
 Diego Rovetta
 Assignee: ARAMCO SERVICES COMPANY
 Title: PHYSICS-CONSTRAINED DEEP LEARNING JOINT
 INVERSION

 Filed: December 14, 2020
Attorney Docket No: 18733-299002
24. **Application No.:** 17/454,539
 Inventor: Wei Wang
 Hooisweng Ow
 Sehoon Chang
 Assignee: ARAMCO SERVICES COMPANY
 Title: POLYMER NANO-CLAYS AS MULTIFUNCTIONAL MUD
 LOGGING BARCODE TRACERS

 Filed: November 11, 2021
Attorney Docket No: 18733-455001

25. **Application No.:** 17/144,677
 Inventor: Hui-Hai Liu
 Jilin Zhang
 Huseyin Onur Balan
 Feng Liang

 Assignee: ARAMCO SERVICES COMPANY
 Title: DETERMINATION OF STIMULATED RESERVOIR
 VOLUME AND ESTIMATED ULTIMATE RECOVERY OF
 HYDROCARBONS FOR UNCONVENTIONAL RESERVOIR

 Filed: Janaury 8, 2021
Attorney Docket No: 18733-206001

26. **Application No.:** 17/650,804
 Inventor: Peter J. Boul

 Assignee: ARAMCO SERVICES COMPANY
 Title: EMULSION SHEAR BOND ENHANCED CEMENT

 Filed: February 11, 2022
Attorney Docket No: 18733-372001

27. **Application No.:** 17/165,372
 Inventors: Murtadha J. AlTammar
 Khalid Mohammed Alruwaili
 Dung T. Phan

 Assignee: ARAMCO SERVICES COMPANY
 Title: METHOD AND SYSTEM FOR AUTONOMOUS FLOW
 RATE CONTROL IN HYDRAULIC STIMULATION
 OPERATIONS

 Filed: Feburary 2, 2021

Attorney Docket No: 18733-251001

28. Application No.: 17/157,340

Inventor: Chao Liu
Dung T. Phan
Younane N. Abousleiman

Assignee: ARAMCO SERVICES COMPANY

Title: TWO METHODS OF DETERMINING PERMEABILITIES
OF NATURALLY FRACTURED ROCKS FROM
LABORATORY MEASUREMENTS

Filed: January 25, 2021

Attorney Docket No: 18733-266001

29. Application No.: 17/069,080

Inventor: Klemens Katterbauer
Alberto Marsala
Nouf Jabri
Martin E. Poitzsch

Assignee: ARAMCO SERVICES COMPANY

Title: SYSTEMS AND METHODS FOR DRILLING A
WELLBORE USING TAGGANT ANALYSIS

Filed: October 13, 2020

Attorney Docket No: 18733-187001

30. Application No.: 17/143,583

Inventor: Hui-Hai Liu
Jilin Zhang
Jewel Duncan

Assignee: ARAMCO SERVICES COMPANY

Title: METHOD AND APPARATUS FOR MEASURING STRESS
DEPENDENCY OF SHALE PERMEABILITY WITH

STEADY-STATE FLOW

Filed: January 7, 2021

Attorney Docket No: 18733-177001

31. **Application No.:** 17/011,285
- Inventors:** Hasmukh A. Patel
Carl Thaemlitz
- Assignee:** ARAMCO SERVICES COMPANY
- Title:** RESERVOIR DRILLING FLUIDS CONSIST OF CATIONIC
HETEROCYCLIC POLYMERS, SYNTHESIS,
FORMULATION, AND APPLICATIONS

Filed: September 3, 2020

Attorney Docket No: 18733-216001

32. **Application No.:** 17/091,402
- Inventor:** Miguel Gonzalez
Subhash Chandrabose Ayirala
Lyla Maskeen
Abdulkarim Sofi
- Assignee:** ARAMCO SERVICES COMPANY
- Title:** DEVICE AND METHOD TO OBTAIN THE VISCOSITY OF
POLYMER FLUIDS USED FOR ENHANCED OIL
RECOVERY

Filed: November 6, 2020

Attorney Docket No: 18733-267001

33. **Application No.:** 16/901,620
- Inventor:** Shannon Lee Eichmann
Gary Eppler
Joshua Brothers

David Jacobi

Assignee: ARAMCO SERVICES COMPANY

Title: SAMPLE HOLDER FOR USING MOUNTED SEM
SAMPLES IN UPRIGHT AND INVERTED OPTICAL
MICROSCOPES AND SPECTROMETERS

Filed: June 15, 2020

Attorney Docket No: 18733-039001

34. **Application No.:** 17/371,736

Inventor: Wenwen Li
Rajesh Saini
Shawn Rimassa

Assignee: ARAMCO SERVICES COMPANY

Title: HIGH VISCOSITY FRICTION REDUCER FOR
FRACTURING FLUID

Filed: July 9, 2021

Attorney Docket No: 18733-112002

35. **Application No.:** 17/375,417

Inventors: Chengzhe Gao
Shitong Sherry Zhu
Marta Antoniv
Nouf AlJabari

Assignee: ARAMCO SERVICES COMPANY

Title: DEGRADABLE TAGS FOR DEPTH CORRELATION MUD
LOGGING

Filed: July 14, 2021

Attorney Docket No: 18733-048002

36. **Application No.:** 14/644,832

Inventor: Khalid AlRuwaili
Murtadha J. AlTammar
Yanhui Han

Assignee: ARAMCO SERVICES COMPANY

Title: THICK-WALL CYLINDER EXPERIMENT SETUP FOR
WELLBORE STABILITY ANALYSIS

Filed: December 17, 2021

Attorney Docket No: 18733-592001

37. Application No.: 17/643,487

Inventor: Damian Pablo San Roman Alerigi
Adrian Cesar Cavazos Sepulveda
Sameeh Issa Batarseh
Jose Oliverio Alvarez

Assignee: ARAMCO SERVICES COMPANY

Title: DEFORMATION MONITORING MECHANISM WITH
MULTI-PIXEL ANGLE-SENSITIVE LASER RANGING

Filed: December 9, 2021

Attorney Docket No: 18733-747001

38. Application No.: 17/363,326

Inventor: Murtadha J. AlTammar
Khalid M. Alruwaili
Osman Hamid
Weichang Li

Assignee: ARAMCO SERVICES COMPANY

Title: METHOD AND SYSTEM FOR CORRECTING AND
PREDICTING SONIC WELL
LOGS USING PHYSICS-CONSTRAINED MACHINE
LEARNING

Filed: June 30, 2021

Attorney Docket No: 18733-458001

39. Application No.: 18/342,487

Inventors: Yanhui Han
Rima T. Alfaraj
Khaqan Khan
Dung Phan
Chao Liu
Khalid AlRuwaili
Murtadha J. AlTammar

Assignee: ARAMCO SERVICES COMPANY

Title: CAPTURING MOST SEVERE FAILURE REGIONS
AROUND BOREHOLE IN ANALYTICAL POROELASTIC
ANALYSIS

Filed: June 27, 2023

Attorney Docket No: 18733-1100001

40. Application No.: 18/326,986

Inventor: Yahhui Han
Dung T. Phan
Chao Liu
Khaqan Khan
Rima Taqi AlFaraj
Khalid M. Alruwaili
Murtadha J. AlTammar

Assignee: ARAMCO SERVICES COMPANY

Title: AN INTEGRATIVE WORKFLOW OF CONSTRUCTING
MECHANICAL EARTH MODEL (MEM) FOR WELLBORE
DRILLING

Filed: May 31, 2023

Attorney Docket No: 18733-1108001

41. Application No.: 18/343,668

Inventor: Vladimir Kazei
Aleksei Titov
Andrey Bakulin

Assignee: ARAMCO SERVICES COMPANY

Title: DAS DEPTH CALIBRATION WITH MULTI-GAUGE
LENGTH INTERROGATION

Filed: June 28, 2023

Attorney Docket No: 18733-947001

42. Application No.: 17/814,170

Inventor: Jin-Hong Chen
Stacey M. Althaus
Mohammed Boudjatit
Gary Eppler

Assignee: ARAMCO SERVICES COMPANY

Title: A METHOD TO DETERMINE AN UNCORRUPTED
NUCLEAR MAGNETIC RESONANCE RESPONSE FROM
A SAMPLE

Filed: July 21, 2022

Attorney Docket No: 18733-879001

43. Application No.: 18/344,666

Inventors: Rabah Mesdour
Jilin Jay Zhang
Hui-Hai Liu
Faisal F. Almalki

Assignee: ARAMCO SERVICES COMPANY

Title: METHOD AND SYSTEM FOR PREDICTING
HYDROCARBON DATA FOR UNCONVENTIONAL
RESERVOIRS USING MACHINE LEARNING

Filed: June 29, 2023

Attorney Docket No: 18733-1106001

44. Application No.: 18/345,113

Inventor: Mokhles M. Mezghani
Tao Lin
Chicheng Xu
Weichang Li

Assignee: ARAMCO SERVICES COMPANY

Title: SYSTEM AND METHOD FOR AUTOMATED AND
ACCURATE CORE PHOTOS LABELING IN MACHINE
LEARNING BASED CORE PROPERTIES PREDICTION

Filed: June 30, 2023

Attorney Docket No: 18733-1418001

45. Application No.: 17/937,309

Inventor: Jin-Hong Chen
Stacey M. Althaus
Mohammed Boudjatit
Houzhu Zhang

Assignee: ARAMCO SERVICES COMPANY

Title: A METHOD TO DETERMINE A MASS OF AN ABSORBED
GAS AND A MASS OF A PORE GAS IN A SAMPLE

Filed: September 30, 2022

Attorney Docket No: 18733-880001

46. Application No.: 18/325,777

Inventor: Jilin Zhang
Hui-Hai Liu
Feng Liang
Moemen A. Abdelrahman

Assignee: ARAMCO SERVICES COMPANY

Title: PREDICTING WELL PERFORMANCE FROM
UNCONVENTIONAL RESERVOIRS WITH THE
IMPROVED MACHINE LEARNING METHOD FOR A
SMALL TRAININ

Filed: May 30, 2023

Attorney Docket No: 18733-1176001

47. Application No.: 17/814,447

Inventors: Chicheng Xu
Tao Lin
Yuchen Jin
Weichang Li
Mohamed Larbi Zeghlache

Assignee: ARAMCO SERVICES COMPANY

Title: SYSTEM AND METHOD FOR RAPID WELL LOG
VALIDATION

Filed: July 22, 2022

Attorney Docket No: 18733-877001

48. Application No.: 18/324,857

Inventor: Hui Hai Liu
Jilin Zhang
Mohammed Boudjatit
Gary Eppler

Assignee: ARAMCO SERVICES COMPANY

Title: SYSTEMS AND METHODS TO DETERMINE
PERMEABILITY OF ROCK UNDER ANISOTROPIC
STRESS

Filed: May 26, 2023

Attorney Docket No: 18733-1104001

49. **Application No.:** 63/516,754
 Inventor: Martin E. Poitzsch
 Chicheng Xu
 Shouxiang Ma

 Assignee: ARAMCO SERVICES COMPANY
 Title: USING ARTIFICIAL INTELLIGENCE METHODS TO
 EXPLOIT WELL LOGGING DATA

 Filed: July 31, 2023
Attorney Docket No: 18733-1102001

50. **Application No.:** 17/150,142
 Inventor: Yanhui Han
 Dung Phan
 Khalid AlRuwaili

 Assignee: ARAMCO SERVICES COMPANY
 Title: A HYBRID PROCEDURE FOR EVALUATING STRESS
 MAGNITUDE AND DISTRIBUTION ON A LINER

 Filed: January 15, 2021
Attorney Docket No: 18733-209001

51. **Application No.:** 17/644,697
 Inventors: Yanhui Han
 Kaiming Xia

 Assignee: ARAMCO SERVICES COMPANY
 Title: SYSTEM AND METHOD FOR DETERMINING A
 DIRECTION FOR DRILLING A WELL

 Filed: December 16, 2021

Attorney Docket No: 18733-489001

52. Application No.: 17/645,330

Inventor: Yanhui Han
Feng Liang
Khalid Mohammed Alruwaili

Assignee: ARAMCO SERVICES COMPANY

Title: A WORKFLOW FOR OPTIMIZING ENGINEERING
PROCEDURE TO REDUCE BOREHOLE BREAKDOWN
PRESSURE BY COMBINATION OF ORIENTED...

Filed: December 21, 2021

Attorney Docket No: 18733-491001

53. Application No.: 17/470,796

Inventor: Constantin Sandu
Ibrahim Atwah

Assignee: ARAMCO SERVICES COMPANY

Title: SYSTEM AND METHOD FOR RESERVOIRED OIL
PRODUCTION BASED ON CALCULATED COMPOSITION
OF NATURAL TRACERS

Filed: September 9, 2021

Attorney Docket No: 18733-194002

54. Application No.: 17/197,696

Inventor: Stacey Marie Althaus
Jing-Hong Chen
Mohammed Boudjatit

Assignee: ARAMCO SERVICES COMPANY

Title: NUCLEAR MAGNETIC RESONANCE METHOD
QUANTIFYING FRACTURES IN UNCONVENTIONAL
SOURCE ROCKS

Filed: March 10, 2021

Attorney Docket No: 18733-292001

55. Application No.: 17/372,161

Inventors: Jing-Hong Chen
Stacey Marie Althaus
Houzhu Zhang
Hui-Hai Liu
Mohammed Boudjatit

Assignee: ARAMCO SERVICES COMPANY

Title: DETERMINATION OF ESTIMATED MAXIMUM
RECOVERABLE (EMR) HYDROCARBONS IN
UNCONVENTIONAL RESERVOIRS

Filed: July 9, 2021

Attorney Docket No: 18733-461001

56. Application No.: 18/306,013

Inventors: Vijay Ramakrishnan
Alejandro Vera
Muhammad Arsalan
Sakethraman Mahalingam

Assignee: ARAMCO SERVICES COMPANY

Title: MEASUREMENT OF BULK FLOW VELOCITY AND
MIXTURE SOUND SPEED USING AN ARRAY OF
DYNAMIC PRESSURE SENSORS

Filed: April 24, 2023

Attorney Docket No: 18733-1112001



UNITED STATES PATENT AND TRADEMARK OFFICE

UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND
DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE

OCTOBER 19, 2023

PTAS

BENJAMIN MCLAUGHLIN
1100 LOUISIANA ST
HOUSTON, TX 77002

508178476

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ASSIGNOR:

ARAMCO SERVICES COMPANY

DOC DATE: 08/30/2023

ASSIGNEE:

SAUDI ARAMCO UPSTREAM TECHNOLOGIES
COMPANY
P.O. BOX 62
BUILDING 2297, ROOM GA-313
DHAHRAN, SAUDI ARABIA 31311

APPLICATION NUMBER: 14644832

FILING DATE: 03/11/2015

PATENT NUMBER:

ISSUE DATE:

TITLE: HIGH-THROUGHPUT CULTURE AND TRANSFER DEVICE AND METHOD

APPLICATION NUMBER: 16901620

FILING DATE: 06/15/2020

PATENT NUMBER: 11719923

ISSUE DATE: 08/08/2023

TITLE: SAMPLE HOLDER FOR USING MOUNTED SEM SAMPLES IN UPRIGHT AND INVERTED OPTICAL MICROSCOPES AND SPECTROMETERS

APPLICATION NUMBER: 17011285

FILING DATE: 09/03/2020

PATENT NUMBER: 11685852

ISSUE DATE: 06/27/2023

TITLE: RESERVOIR DRILLING FLUIDS CONSIST OF CATIONIC HETEROCYCLIC POLYMERS, SYNTHESIS, FORMULATION, AND APPLICATIONS

APPLICATION NUMBER: 17038345 FILING DATE: 09/30/2020
 PATENT NUMBER: ISSUE DATE:
 TITLE: WATERFLOOD FRONT IMAGING USING SEGMENTALLY INSULATED WELL LINERS
 AS ON-DEMAND ELECTRODES

APPLICATION NUMBER: 17069080 FILING DATE: 10/13/2020
 PATENT NUMBER: 11719092 ISSUE DATE: 08/08/2023
 TITLE: SYSTEMS AND METHODS FOR DRILLING A WELLBORE USING TAGGANT
 ANALYSIS

APPLICATION NUMBER: 17091402 FILING DATE: 11/06/2020
 PATENT NUMBER: 11714039 ISSUE DATE: 08/01/2023
 TITLE: DEVICE AND METHOD TO OBTAIN THE VISCOSITY OF POLYMER FLUIDS USED
 FOR ENHANCED OIL RECOVERY

APPLICATION NUMBER: 17121044 FILING DATE: 12/14/2020
 PATENT NUMBER: ISSUE DATE:
 TITLE: PHYSICS-CONSTRAINED DEEP LEARNING JOINT INVERSION

APPLICATION NUMBER: 17141783 FILING DATE: 01/05/2021
 PATENT NUMBER: ISSUE DATE:
 TITLE: IN-SITU POLYPHOSPHAZENE GENERATION IN CEMENT FOR IMPROVED
 ELASTIC PROPERTIES

APPLICATION NUMBER: 17143583 FILING DATE: 01/07/2021
 PATENT NUMBER: 11598711 ISSUE DATE: 03/07/2023
 TITLE: METHOD AND APPARATUS FOR MEASURING STRESS DEPENDENCY OF SHALE
 PERMEABILITY WITH STEADY-STATE FLOW

APPLICATION NUMBER: 17144677 FILING DATE: 01/08/2021
 PATENT NUMBER: 11702924 ISSUE DATE: 07/18/2023
 TITLE: DETERMINATION OF STIMULATED RESERVOIR VOLUME AND ESTIMATED
 ULTIMATE RECOVERY OF HYDROCARBONS FOR UNCONVENTIONAL RESERVOIRS

APPLICATION NUMBER: 17150142 FILING DATE: 01/15/2021
 PATENT NUMBER: ISSUE DATE:
 TITLE: HYBRID PROCEDURE FOR EVALUATING STRESS MAGNITUDE AND
 DISTRIBUTION ON A LINER

APPLICATION NUMBER: 17155735 FILING DATE: 01/22/2021
 PATENT NUMBER: ISSUE DATE:
 TITLE: DOWNHOLE COUPON HOLDER

APPLICATION NUMBER: 17155803 FILING DATE: 01/22/2021
 PATENT NUMBER: ISSUE DATE:
 TITLE: METHOD FOR DETERMINING IN-SITU MAXIMUM HORIZONTAL STRESS

17157290

APPLICATION NUMBER: 17157290 FILING DATE: 01/25/2021
 PATENT NUMBER: 11773704 ISSUE DATE: 10/03/2023
 TITLE: METHODS FOR TIGHT OIL PRODUCTION THROUGH SECONDARY RECOVERY
 USING SPACED PRODUCER AND INJECTOR WELLBORES

APPLICATION NUMBER: 17157340 FILING DATE: 01/25/2021
 PATENT NUMBER: 11519879 ISSUE DATE: 12/06/2022
 TITLE: TWO METHODS OF DETERMINING PERMEABILITIES OF NATURALLY FRACTURED
 ROCKS FROM LABORATORY MEASUREMENTS

APPLICATION NUMBER: 17165372 FILING DATE: 02/02/2021
PATENT NUMBER: 11680469 ISSUE DATE: 06/20/2023
TITLE: METHOD AND SYSTEM FOR AUTONOMOUS FLOW RATE CONTROL IN HYDRAULIC
STIMULATION OPERATIONS

APPLICATION NUMBER: 17167501 FILING DATE: 02/04/2021
PATENT NUMBER: ISSUE DATE:
TITLE: METHOD AND SYSTEM FOR DRILLING FLUID CONDITION MONITORING

APPLICATION NUMBER: 17197696 FILING DATE: 03/10/2021
PATENT NUMBER: 11579326 ISSUE DATE: 02/14/2023
TITLE: NUCLEAR MAGNETIC RESONANCE METHOD QUANTIFYING FRACTURES IN
UNCONVENTIONAL SOURCE ROCKS

APPLICATION NUMBER: 17316280 FILING DATE: 05/10/2021
PATENT NUMBER: ISSUE DATE:
TITLE: SYSTEM AND METHOD FOR TESTING CEMENT

APPLICATION NUMBER: 17363326 FILING DATE: 06/30/2021
PATENT NUMBER: ISSUE DATE:
TITLE: METHOD AND SYSTEM FOR CORRECTING AND PREDICTING SONIC WELL LOGS
USING PHYSICS-CONSTRAINED MACHINE LEARNING

APPLICATION NUMBER: 17371736 FILING DATE: 07/09/2021
PATENT NUMBER: 11732185 ISSUE DATE: 08/22/2023
TITLE: HIGH VISCOSITY FRICTION REDUCER FOR FRACTURING FLUID

APPLICATION NUMBER: 17372161 FILING DATE: 07/09/2021
PATENT NUMBER: 11740381 ISSUE DATE: 08/29/2023
TITLE: DETERMINATION OF ESTIMATED MAXIMUM RECOVERABLE (EMR)
HYDROCARBONS IN UNCONVENTIONAL RESERVOIRS

APPLICATION NUMBER: 17375417 FILING DATE: 07/14/2021
PATENT NUMBER: 11697755 ISSUE DATE: 07/11/2023
TITLE: DEGRADABLE TAGS FOR DEPTH CORRELATION MUD LOGGING

APPLICATION NUMBER: 17394547 FILING DATE: 08/05/2021
PATENT NUMBER: ISSUE DATE:
TITLE: METHODS FOR DELAYING IN SITU ACID GENERATION FOR ACID DELIVERY
TO A SITE

APPLICATION NUMBER: 17409271 FILING DATE: 08/23/2021
PATENT NUMBER: ISSUE DATE:
TITLE: MODIFIED CARBON NANOMATERIALS AS TRACERS FOR RESERVOIR
MONITORING

APPLICATION NUMBER: 17454539 FILING DATE: 11/11/2021
PATENT NUMBER: 11692440 ISSUE DATE: 07/04/2023
TITLE: POLYMER NANO-CLAYS AS MULTIFUNCTIONAL MUD LOGGING BARCODE
TRACERS

APPLICATION NUMBER: 17455128 FILING DATE: 11/16/2021
PATENT NUMBER: ISSUE DATE:
TITLE: METHOD AND SYSTEM FOR DETERMINING GAMMA-RAY MEASUREMENTS USING A
SENSITIVITY MAP AND CONTROLLED SAMPLING MOTION

APPLICATION NUMBER: 17470796 FILING DATE: 09/09/2021
PATENT NUMBER: ISSUE DATE:
TITLE: SYSTEM AND METHOD FOR RESERVOIRED OIL PRODUCTION BASED ON
CALCULATED COMPOSITION OF NATURAL TRACERS

APPLICATION NUMBER: 17490348 FILING DATE: 09/30/2021
PATENT NUMBER: ISSUE DATE:
TITLE: IN-SITU MONITORING OF CHEMICAL FINGERPRINTS IN OILFIELD APPLICATIONS

APPLICATION NUMBER: 17643487 FILING DATE: 12/09/2021
PATENT NUMBER: ISSUE DATE:
TITLE: DEFORMATION MONITORING MECHANISM WITH MULTI-PIXEL ANGLE-SENSITIVE LASER RANGING

APPLICATION NUMBER: 17644103 FILING DATE: 12/14/2021
PATENT NUMBER: ISSUE DATE:
TITLE: METHOD FOR QUADRIMODAL FAULT PREDICTION USING STRAIN TENSOR CYCLIDES

APPLICATION NUMBER: 17644119 FILING DATE: 12/14/2021
PATENT NUMBER: ISSUE DATE:
TITLE: BLOWING AGENT INCORPORATED RESIN SYSTEMS FOR CONSOLIDATING SUBTERRANEAN OIL AND GAS BEARING FORMATIONS

APPLICATION NUMBER: 17644346 FILING DATE: 12/15/2021
PATENT NUMBER: ISSUE DATE:
TITLE: FOAMED WETTABILITY ALTERATION TREATMENT FOR DEEP CONDENSATE AND WATER BLOCKAGE IN GAS RESERVOIRS

APPLICATION NUMBER: 17644450 FILING DATE: 12/15/2021
PATENT NUMBER: ISSUE DATE:
TITLE: SALT TOLERANT FRICTION REDUCER

APPLICATION NUMBER: 17644697 FILING DATE: 12/16/2021
PATENT NUMBER: ISSUE DATE:
TITLE: SYSTEM AND METHOD FOR DETERMINING A DIRECTION FOR DRILLING A WELL

APPLICATION NUMBER: 17644845 FILING DATE: 12/17/2021
PATENT NUMBER: ISSUE DATE:
TITLE: METHOD AND SYSTEM FOR GENERATING FORMATION PROPERTY VOLUME USING MACHINE LEARNING

APPLICATION NUMBER: 17645330 FILING DATE: 12/21/2021
PATENT NUMBER: ISSUE DATE:
TITLE: WORKFLOW FOR OPTIMIZING ENGINEERING PROCEDURE TO REDUCE BOREHOLE BREAKDOWN PRESSURE BY COMBINATION OF ORIENTED NOTCHING/PERFORATION AND FLUID CHEMICAL CONDITIONING PROCESS IN OPEN AND CASED HOLE

APPLICATION NUMBER: 17647416 FILING DATE: 01/07/2022
PATENT NUMBER: ISSUE DATE:
TITLE: SYNTHESIS AND USE OF GRAFTED GRAPHENE IN AQUEOUS DRILLING FLUIDS AS LOW SHEAR RATE VISCOSITY ENHANCER

APPLICATION NUMBER: 17647428 FILING DATE: 01/07/2022
PATENT NUMBER: ISSUE DATE:
TITLE: SYNTHESIS AND USE OF GRAFTED GRAPHENE IN OIL BASED DRILLING FLUIDS AS LOW SHEAR RATE VISCOSITY ENHANCER

APPLICATION NUMBER: 17648034 FILING DATE: 01/14/2022
PATENT NUMBER: ISSUE DATE:
TITLE: METHOD FOR THE DETERMINATION OF MUD WEIGHT WINDOW IN N-POROSITY N-PERMEABILITY FORMATIONS

APPLICATION NUMBER: 17649505 FILING DATE: 01/31/2022
PATENT NUMBER: ISSUE DATE:
TITLE: POROUS POLYURETHANE PARTICLE COMPOSITION AND METHODS THEREOF

APPLICATION NUMBER: 17650804 FILING DATE: 02/11/2022
PATENT NUMBER: 11739247 ISSUE DATE: 08/29/2023
TITLE: EMULSION SHEAR BOND ENHANCED CEMENT

APPLICATION NUMBER: 17724132 FILING DATE: 04/19/2022
PATENT NUMBER: ISSUE DATE:
TITLE: ACID CORROSION INHIBITORS

APPLICATION NUMBER: 17814170 FILING DATE: 07/21/2022
PATENT NUMBER: ISSUE DATE:
TITLE: METHOD TO DETERMINE AN UNCORRUPTED NUCLEAR MAGNETIC RESONANCE
RESPONSE FROM A SAMPLE

APPLICATION NUMBER: 17814447 FILING DATE: 07/22/2022
PATENT NUMBER: ISSUE DATE:
TITLE: SYSTEM AND METHOD FOR RAPID WELL LOG VALIDATION

APPLICATION NUMBER: 17937309 FILING DATE: 09/30/2022
PATENT NUMBER: ISSUE DATE:
TITLE: METHOD TO DETERMINE A MASS OF AN ABSORBED GAS AND A MASS OF A
PORE GAS IN A SAMPLE

APPLICATION NUMBER: 18046351 FILING DATE: 10/13/2022
PATENT NUMBER: ISSUE DATE:
TITLE: METHOD TO ACCELERATE ACID REACTIVITY DURING RESERVOIR
STIMULATION

APPLICATION NUMBER: 18306013 FILING DATE: 04/24/2023
PATENT NUMBER: ISSUE DATE:
TITLE: MEASUREMENT OF BULK FLOW VELOCITY AND MIXTURE SOUND SPEED USING
AN ARRAY OF DYNAMIC PRESSURE SENSORS

APPLICATION NUMBER: 18324857 FILING DATE: 05/26/2023
PATENT NUMBER: ISSUE DATE:
TITLE: SYSTEMS AND METHODS TO DETERMINE PERMEABILITY OF ROCK UNDER
ANISOTROPIC STRESS

APPLICATION NUMBER: 18325777 FILING DATE: 05/30/2023
PATENT NUMBER: ISSUE DATE:
TITLE: PREDICTING WELL PERFORMANCE FROM UNCONVENTIONAL RESERVOIRS WITH
THE IMPROVED MACHINE LEARNING METHOD FOR A SMALL TRAINING DATA
SET BY INCORPORATING A SIMPLE PHYSICS CONSTRAIN

APPLICATION NUMBER: 18326986 FILING DATE: 05/31/2023
PATENT NUMBER: ISSUE DATE:
TITLE: INTEGRATIVE WORKFLOW OF CONSTRUCTING MECHANICAL EARTH MODEL
(MEM) FOR WELLBORE DRILLING

APPLICATION NUMBER: 18342487 FILING DATE: 06/27/2023
PATENT NUMBER: ISSUE DATE:
TITLE: CAPTURING MOST SEVERE FAILURE REGIONS AROUND BOREHOLE IN
ANALYTICAL POROELASTIC ANALYSIS

APPLICATION NUMBER: 18343668 FILING DATE: 06/28/2023
PATENT NUMBER: ISSUE DATE:
TITLE: DAS DEPTH CALIBRATION WITH MULTI-GAUGE LENGTH INTERROGATION

APPLICATION NUMBER: 18344666 FILING DATE: 06/29/2023
PATENT NUMBER: ISSUE DATE:
TITLE: METHOD AND SYSTEM FOR PREDICTING HYDROCARBON DATA FOR
UNCONVENTIONAL RESERVOIRS USING MACHINE LEARNING

APPLICATION NUMBER: 18345113 FILING DATE: 06/30/2023
PATENT NUMBER: ISSUE DATE:
TITLE: SYSTEM AND METHOD FOR AUTOMATED AND ACCURATE CORE PHOTOS
LABELING IN MACHINE LEARNING BASED CORE PROPERTIES PREDICTION

APPLICATION NUMBER: 63516754 FILING DATE: 07/31/2023
PATENT NUMBER: ISSUE DATE:
TITLE: USING ARTIFICIAL INTELLIGENCE METHODS TO EXPLOIT WELL LOGGING
DATA

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