# Kenneth D. Oglesby

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**EDUCATION:**

Masters of Science in Engineering, May 1980, The University of Tulsa, graduated Cum Laude. Masters Thesis titled "Oil- Water Flow in Horizontal Pipes".

Bachelor of Science in Petroleum Engineering, May 1976, The University of Tulsa
Graduated Cum Laude. Selected as an Outstanding Senior for 1976.

**PROFESSIONAL EXPERIENCE:**

Impact Earth LLC (IE). 2009 – 2012. President. IE commercialized the FLASH ASJ™ and other technologies for installing (drilling and completing) the heat transfer bores for (shallow geothermal) ground source heat pumps.

SPI Technologies LLC (SPI). 2006-present. President. SPI develops and commercializes the innovative gel systems for fluid shut-off and conformance in oilfield waterfloods, $CO_2$ in enhanced oil recovery projects, and for influx shutoff and stabilization in drilling operations.

Impact Technologies LLC (IT). 2004 – present. President. Impact manages technology development through design, patenting, prototyping and commercializing phases. Product development includes multiple technologies on specialized metering, abrasive slurry drilling and cutting (including FLASH ASJ™), SPI Gels water shutoff and mitigation, pneumatic/ hydraulic energy storage, ground source heat exchange loops and low cost deep well pumping methods. Impact has had U.S. Department of Energy (DOE), Stripper Well Consortium (SWC) and/ or Oklahoma Center for the Advancement of Science and Technology (OCAST) technology development contracts (with KDO as PI or co-PI).

Thousand Oaks Investment Corporation. 1995- present. Owner and Vice President. Commercial real estate management and development.

Acorn Resources, Inc, 1992 – present. Owner and Vice President. Acorn holds non-operated interests (WI, ORRI, RI) in oil/gas properties.

Oak Resources, Inc., 1987 - 2012. Owner and President. Oak operated oil and gas wells in Oklahoma and Texas. Oak also developed technology for marginal opil wells.

CEALC, Inc. 1994-1995. International Business Manager. Managed the Tulsa office business, Mexico operations and contract negotiations for three (3) production improvement (gas lift) consulting contracts with Pemex (through Halliburton). Initiated contract discussions for Nigeria and Venezuela.

CNG Producing Company 1985 – 1987. Regional Lead/Senior Engineer, Tulsa, Oklahoma. Performed engineering studies and directed production, workover and drilling programs covering Oklahoma and Texas.

Mapco Oil and Gas Company 1982 – 1984. Division Engineer, Tulsa, Oklahoma. Performed engineering studies and directed production, workover, enhanced recovery and drilling programs covering Oklahoma and Texas.

Chevron U.S.A. 1977 – 1981. Production, Reservoir, Research, Drilling Engineer, New Orleans, Louisiana and Los Angeles / La Habra, California. On-site supervision of drilling operations of 22,000' Tuscaloosa wells and offshore directional wells in both Louisiana and Mississippi. Production engineering on pumped, flowing and gas lifted oil/gas wells, onshore and offshore. Research on horizontal laterals for heavy oil steam-flooding and polymer/caustic chemical EOR processes for US and Canada properties.

**SOCIETY OF PETROLEUM ENGINEERS PROFESSIONAL HONORS, AWARDS AND ACTIVITIES:**

SPE International Board of Directors, 1998 - 2001
SPE Distinguished Member 2008
SPE Distinguished Service Award 2008
SPE Representative to the Petroleum Technology Transfer Council (PTTC)
Executive Board 2004- 2007
SPE/DOE Improved Oil Recovery (IOR/EOR) Symposium and Exhibition
General Chairman 2004 IOR Conference
Various IOR committee Chairs (Exhibits, Sponsorships, Finance,..) 1986-2012
Mid-Continent Regional Service Award 2004
Numerous SPEI Board Mid-Continent Section Standing and Ad Hoc Committees
Mid-Continent Section-Section Chairman 1990-1991
SPE 25+ Year Club
SPE Student Chapter President, University of Tulsa, 1976
First Place in Rocky Mountain Regional Student Paper Contest 1975
SPE Society Member 1974 - present.

**OTHER PROFESSIONAL ORGANIZATIONS, HONORS AND ACTIVITIES**:

Registered Professional Engineer - Oklahoma PE #13766 1976-present
Registered Texas Directional Driller
Oklahoma Journal Record- April 2007 "On The Brink" Innovator Award
Mid-Continent Coal Bed Methane Symposium- Board Member 2004
Stripper Well Consortium- 2003-present member
Executive Council 2005- 2008
Petroleum Technology Transfer Council (PTTC)
Executive Board, SPE representative 2004- 2007
Oklahoma Commission on Marginally Producing Oil and Gas Wells
Commissioner- 2002- 2005 (Governor appointed, Senate approved)
Industry Advisory Council- Chair 2000-2001, Member 1997-present
Speakers Bureau for Industry Relations with talks to Desk & Derrick, OK
Title and Divisional Order Specialists and others
US Department of Energy Conference on Microhole Technology, Panelist, April 2003
Department of Energy Unconventional Resources Technology Advisory Committee to
Secretary Steven Chu (Secretary appointed, White House approved), 2010-2012
International Energy Advocates -
Executive Board 2005- 2008, Advisory Board 2005- 2005
Member 1998- present

2004 International Policy Conference, committee chair, Tulsa,OK
2003 International Policy Conference, committee chair, Washington DC
2002 International Policy Conference, committee chair, Oklahoma City, OK

University of Tulsa, Petroleum Engineering Department, Industry Advisory Board
IAB Chairman 1998 - 2001 , Member 1990- current

Tau Beta Pi, Pi Epsilon Tau, Phi Gamma Kappa

Tulsa Engineering Foundation
Board Trustee 1994 – 1997, Vice-President 1991 – 1992
Engineering Explorer Post 3.14 Sponsor and Leader

University of Tulsa, Outstanding Senior , 1976

AAPG- Associate Member
Oklahoma Independent Petroleum Association (OIPA)- Member
Independent Producers Association of America (IPAA)- Member
US Chamber of Commerce- Member
American Petroleum Institute (API, NE Oklahoma)- Past Member
National Stripper Well Association (NSWA)- Member
Water Jet Association- Member
International Ground Source Heat Pump Association member

**PUBLICATIONS:**

Oglesby,K, presentation of unpublished paper, SPE California Regional Meeting, 1980

Oglesby,K, Blevins, T, Rogers, E and Johnson, W; SPE Paper No. 8833, "Status of the Ten-Pattern Steamflood, Kern River Field, California". Presentation to the SPE/DOE EOR Symposium, April 1980.

Oglesby,K, Blevins, T, Rogers, E and Johnson, W; "Status of the Ten-Pattern Steamflood, Kern River Field, California", Published SPE JPT, October 1982.

Arirachakaran, S, Oglesby, K., Malinowsky, M., Shoham,O. and Brill, J; SPE Paper No. 18836, "An Analysis of Oil / Water Flow Phenomena in Horizontal Pipes". SPE Production Operations Symposium, Oklahoma City, OK in March 1989.

Oglesby, K., Arellano, L., and Scheer, G.; SPE No. 80919; "Fourteen Years of Progressing Cavity Pumps in a Southern Oklahoma Waterflood", SPE Production Operations Symposium, Oklahoma City, OK in March 2003.

Oglesby, K. and Scheer, G.; Summary of SPE No. 80919; "Fourteen Years of Progressing Cavity Pumps", Journal of Petroleum Technology, May 2003.

Oglesby,K.;"Progressing cavity pumps: Insights from 14 years in a Southern Oklahoma Waterflood"; World Oil article, February 2004.

Oglesby, K., Williams, J. and Mullins, R.; "Coiled composite line pipe: An attractive injection system replacement" PTTC Digest article, October 2004.

Oglesby, K., Williams, J. and Mullins, R.; "Coiled composite line pipe: An attractive injection system replacement" World Oil article, October 2004.

Oglesby, K., Mehdizadeh, P. and Rogers, J., "Field Application of a Portable Well Tester", May 2006, Houston, TX for the University of Texas, Multiphase Metering Users Roundtable.

Krishnamurthy, M., Fahimi, B. and Oglesby, K., "Comparative Evaluation of Axial Flux and Radial Flux Permanent Magnet Synchronous Machines", ICEM PMSP Conference, Greece, July 2006.

Oglesby, K., Mehdizadeh, P. and Rogers, J., SPE 103087, "Portable Multiphase Production Tester for High Water-Cut Wells", SPE Annual Fall Meeting, September 2006, San Antonio, TX .

Arismendi R., Wang S., Mohan R., Shoham O., and Oglesby, K., "Development of Novel 3-Phase Gas-Liquid-Solid Compact Separator for Drilling and Production Systems", XXVIII Oklahoma AIAA/ASME Symposium, March 2008, Tulsa, OK.

Burns L., Burns M., Wilhite P., McCool S., Oglesby K., Glass, J., SPE 113490, "New Generation Silicate Gel System For Casing Repairs and Water Shutoff", SPE-DOE Improved Oil Recovery Symposium, April 2008, Tulsa, OK.

Finsterle S., Zhang Y., Pan L., Dobson P. and Oglesby K., "Use of Microholes in the Development of Improved Fluid Flow and Heat Transfer in EGS Reservoirs: Initial Modeling Results ",AAPG/SPE/SEG Hedberg Conference on "Enhanced Geothermal Systems", 14-18 March 2011, Napa, California

Dr. Yingqi Zhang, Dr. Lehua Pan, Dr. Patrick Dobson, Dr. Stefan Finsterle, Ken Oglesby, "Microholes for Improved Heat Extraction from EGS Reservoirs-Numerical Evaluation", Stanford Geothermal Workshop, January 2012

Ashwin Padsalgikar, Dr. Ram. S. Mohan, and Dr. O. Shoham and Ken Oglesby, "High Pressure Multiphase Slurry Flows through Nozzles", AIAA-ASME Meeting, March 2012, Tulsa, OK.

Stefan Finsterle, Yingqi Zhang, Lehua Pan, Patrick Dobson and Ken Oglesby; "Microhole arrays for improved heat mining from enhanced geothermal systems", published in **Geothermics**, 47 (2013) 104-115.

Dr. Paul Woskov and K. Oglesby, APSDPP meeting Poster, "Application of Fusion Gyrotrons to Enhanced Geothermal Systems (EGS)", Nov2013 in Denver CO.

Dr. Paul Woskov, Ken Oglesby and Dr. Herbert Einstein, "Penetrating Rock with Intense Millimeter-Waves", IEEE IRW-MMW meeting in Tuscan AZ, Fall2014.

**OTHER PROFESSIONAL ACTIVITIES:**

Marginal Well Commission 2003 Movie, "Marginal Wells- Too Important to Lose", producer, publisher and participant

March 2003 presentation to the National Title and Land Analysts on Striper Well Operator Concerns"

Arranged visit of "White House Fellows" to Osage county drilling rig

DOE April 2006 videotape participant on 'Role of Government in Oil and Gas Research'

Stripper Well Commission 2005 Movie, "Independent Oil-Rediscovering America's Forgotten Wells", Interviewee

April 2006 presentation to National Association of Royalty Owners on Marginal Wells

April 2007 presentation to University of Kansas, Tertiary Oil Recovery Projects Meeting, Wichita, KS, "Advanced Technologies for Stripper Well Operators",

Multiple DOE/PTTC Microhole Workshops presentations 2004- 2006.

Multiple Stripper Well Consortium presentations across Nation 2002- 2008

2007, Presentation to Joint Rocky Mountain Operators Association and RMOTC on "Advanced Technologies for Stripper Well Operators"

September 2007 presentation to the i2E Luncheon meeting, Tulsa OK

January 2008, presentation to the Engineers Society of Tulsa on "Technologies IMPACTing Industry", Tulsa OK

26 October 2009, Impact Earth presentation to Oklahoma Venture Capital Forum, Oklahoma City, OK

3 November 2009, Tulsa World Interview

7 December 2009, Tulsa Business Journal Interview

December 2009, Oklahoman Magazine Interview

December 2009, Oklahoma Educational Television (OETA) interview, broadcast and web

May 2010, Innovator of the Year (Impact Earth)
June 2011 presentation to DOE Geothermal Technology Program (GTP) on the status of "Microholes for Geothermal Development"
25August 2010, PTTC talk on "Impact's SWC Projects over Time" at Oklahoma State University- Tulsa Campus
2009 Innovator of the Year- Oklahoma Business Journal
2010 Tulsa Spirit Award Finalist (Impact Earth)
December 2010 participant in Massachusetts Institute of Technology (MIT-Sloan), Universita Commerciale Luigi Bocconi (Italy) and Ludwig-Maximilians-Universitat at Munchen (Germany) international research study on the invention process, incentives and rewards, and value of patents.
24February 2011 webinar presentation for Petroleum Technology Transfer Council (PTTC) on "SPI Gels for the Oil and Gas Industry"
12-13May2011 Multiphase Metering Roundtable meeting, Tulsa OK, co-chair and presenter on "Small Operator Metering Concerns".
5June2011 presentation to Oklahoma Independent Producers Association (OIPA) on "Oilfield Conformance Issues and Methods to Control" and "Call for Industry Action for Support of Technology Development"
7June2011 presentation to Department of Energy (DOE), Geothermal Technology Program (GTP), Bethesda MD, on "Microholes for Geothermal Development"
17June2012 presentation to Department of Energy (DOE), Geothermal Technology Program (GTP), Westminister CO on "Microholes for Geothermal Development"
17June2012 presentation to Department of Energy (DOE), Geothermal Technology Program (GTP), Westminister CO on "Millimeter Wave Drilling for Geothermal Development"
24April2013 presentation to Department of Energy (DOE), Geothermal Technology Program (GTP), Denver CO on "Microholes for Geothermal Development"
24April2013 presentation to Department of Energy (DOE), Geothermal Technology Program (GTP), Denver CO on "Millimeter Wave Drilling for Geothermal Development"
Interview, by Pierrick Blin and Antoine Dion-Ortega for CIM article, "Rock-melting waves-How miners could stop drilling bit by bit", November 2013.

**US AND INTERNATIONAL PATENTS & PATENTS-PENDING:**

"An Inverted Motor for Drilling Rocks and Man- Made Materials and for Re-entry and Cleanout of Existing Wells and Pipes", electric+ version, divisional US Patent #6,920,946 & International Patents-Pending;
"An Inverted Motor for Drilling Rocks and Man- Made Materials and for Re-entry and Cleanout of Existing Wells and Pipes", hydraulic/ pneumatic version, divisional US Patent #7,055,629 & international Patents-Pending;
"High Pressure Slurry Piston Pump", US Patent #7,118,349B2 & Int'l Patents-Pending;
"High Pressure Slurry Plunger Pump", US Patent #7,794,215 and International Patent Pendings;
"Gas-Liquid-Solids Compact Separator", US patent #7,569,098 and International Patents-Pending;
"Multi-Component Aqueous Gel Solution for Control of Delayed Gelatin Timing and for Resulting Gel Properties", US Patent #8822388 and Patents-Pending.
"Inverted Drainholes", US patent #7,934,563 and International Patents-Pending;
"Method and Apparatus for Jet-Assisted Drilling or Cutting", US patent #8,257,147 and International Patents-Pending;
"Concentric Tubing Directional Control", US and International Patents- Pending; and

"TOP Plate Alignment Tool", US Patent #8,056,251 and international patents pending.

**TECHNOLOGY DEVELOPMENT PROJECT STATUS (as of 29 October 2014):**

US Department of Energy, "Deep Borehole Storage of Nuclear Waste using MMW Technology", FOA01046 Topic proposal into STTR Fast Track contract DE-SC00012308, with Dr. Woskov and Dr. Einstein both at the Massachusetts Institute of Technology (MIT) and (co-joined only) Anthony Baros at the US Department of Defense-Air Force Research Laboratory (DOD AFRL). Large scale bench testing of the MMW technology at 100 kilowatts of power and at 95 Gigahertz frequency for drilling, lining and sealing wellbores. Ongoing from July2014 to December 2016.

US Department of Energy, "Prevention, Repair and Mitigation of $CO_2$ Storage Leaks Using SPI Gels", SBIR Phase I contract DE-SC0011991, with Clean Tech Innovations LLC. Development of new internal initiators and mixing methodology for SPI gels with long delay triggers. Phase II (if selected) will be final initiator optimization lab work and field testing. Ongoing from June 2014 to June 2016.

US Department of Energy, "SPI Conformance Gel Applications in Geothermal Zonal Isolation", DE-EE0005508 Phase I and Phase II, project lead by Lyle Burns of Clean Tech Innovations LLC with Impact and Dr. Felber as a contributors. This project extends SPI gels for high temperatures for geothermal conformance and for sealing lost circulation zones during drilling. Ongoing to June 2015

US Department of Energy, "Deep Geothermal Drilling Using Millimeter Wave Technology", DE-EE0005504, Successfully bench tested the millimeter wave technology for drilling and lining wellbores using a low 10 kilowatt power gyrotron at a non-optimal 28 GigaHertz frequency. Also developed surface and downhole tool concepts for furthering the use of MMW technology in the field. Completed September 2014.

US Department of Energy, "Improved Mobility Control for Carbon Dioxide ($CO_2$) Enhanced Oil Recovery Using Silica Polymer Initiator (SPI) Gels ", with Clean Tech Innovations and Redcorn, DE-EE0005958. Developed new initiator technologies and performed SPI treatments in two $CO_2$ flood fields (central Mississippi sandstone, west Texas dolomite). In just 4 treated wells these gels recovered $3MM in incremental crude oil where prior cross-linked PAM gel system did not respond at all. These SPI treatments were less than 5000 bbls per well. Completed January 2014, with extended reporting to November 2014.

US Department of Energy-Geothermal Technologies Program, "Microhole Arrays Drilled with Advanced Abrasive Slurry Jet Technology To Efficiently Exploit Enhanced Geothermal Systems", DE-EE0002783, with Lawrence Berkeley National Laboratory and Missouri University of Science and Technology. Further developed the current FLASH ASJ$^{TM}$ drilling system for extreme conditions of EGS, i.e. 30,000 foot depths and 572°F temperature Downhole requirements too complicated to ensure success at such 30,000 ft depths. Cutting efficiency of the FLASH ASJ system was optimized and very demonstrated to be very high even at high temperatures, but wellbore diameter control was found imperative for success. Regrouping development effort toward combining FLASH ASJ with mechanical rotational bit drilling (patented Inverted Motors) for exceptional

penetration rates in hard rocks. Will also start refocus at shallower applications. Completed June 2013.

US Department of Energy, "Baseline System Costs for a 50 MW Enhanced Geothermal System", contract DE-EE0002742 / 002, with Gas Equipment and Engineering Company (GEECO) where Impact was a contributor. Completed January 2012.

Stripper Well Consortium (via US Department of Energy and Penn State University), "Novel Wind Turbine Power For Oilfield Pumping Units", contract 3988-IT-USDOE-2098 with SKYRON Wind. Designed and fabricated a new vertical axis wind turbine hydraulic/pneumatic energy storage device for powering remote oil & gas wells and other operations. Completed May 2011.

US Department of Energy SBIR Phase I and Phase II, "Novel Low Cost Method to Install Geophones for $CO_2$ Monitoring", contract #DE-FG02-07ER84670, with Dr. Ernie Majer-University of California-Berkley, Dr. Summers-Missouri University of Science and Technology, and Dr. Dwight Rychel. Further developed the FLASH ASJ drilling system using patented HPSP, IMe/ IMh motors, swivels, nozzles and (potentially) MWD, LWD capabilities directed at installing seismic geophones in microholes. Was not able to field test the developed technology due to funding. Completed April 2011.

US Department of Energy-Microhole Technology Initiative, "Advanced Mud System for Microhole Coiled Tubing Drilling", contract DE-FC26-04NT15476, with the University of Missouri at Rolla. Further developed a compact mud processing system (including a patent pending Gas-Liquid-Solid separator and proprietary Dry Filter), a UMR non-rotating nozzle (and fluids), and two High Pressure Abrasive Slurry Plunger Pumps (HPSPs). Completed.

Stripper Well Consortium (via US Department of Energy and Penn State University), "Advanced ASJ Drilling System", contract 3181-IT-USDOE-2098, with OCAST #065 below. Prototyped one version of the High Pressure Slurry Pump (HPSPP), Inverted Motor (IM)-hydraulic motor version, new directional method and direction control system for the abrasive drilling system. Completed 2008.

Oklahoma Center for the Advancement of Science and Technology (OCAST), "High Pressure Slurry Pump", with Impact Slurry Technologies LLC, project #AR082-065. Developed pumps for high pressure slurry drilling and cutting applications. Completed 2008.

Stripper Well Consortium (via US Department of Energy and Penn State University), "Novel Low Rate Electric Plunger Pump System", contract 3450-IT-USDOE-2098 with Dr. Fahimi-University of Texas-Arlington and Shell. Concurrent with OCAST #049 below. Designed an new version of an electrical driven positive displacement pump for dewatering deep gas wells. Found that tolerances for the gap between the electric motor's rotor and stator were too tight for success. Newer piezoelectric downhole pumps appeared to have higher potential for success. Completed 2008.

Oklahoma Center for the Advancement of Science and Technology (OCAST), "Deep Well Dewatering Pump", contract OARS AR08(1)-049 with UT-Arlington and Shell. Designed a downhole electric driven positive displacement pump for dewatering deep gas wells and other low rate wells with the above SWC project. Completed 2008.

Oklahoma Center for the Advancement of Science and Technology, "Novel Gas-Liquid-Solid Separator in Drilling/Production", project #AR06(1)-048, with the University of Tulsa. Developed a patented front-end /pre-processing gas-liquid-solid (GLS) separator / concentrator for gas, liquids and solids in production and drilling operations. Completed 2008

Oklahoma Center for the Advancement of Science and Technology, "Novel Inverted Electric Motor for Drilling", OARS contract #6806-AR06(2)-051, with Dr Fahimi at University of Texas-Arlington. Prototyped patented IM-electric low speed (0-2000 rpm) high efficiency, stacked electric inverted motor for drilling and other applications. Determined that tolerances between stator and rotor were too tight for rugged downhole drilling conditions. Must redesign power train for incremental stages to allow for bending of unit. Completed July 2008.

US Department of Energy – "Advanced Ultra-High Speed Motor for Drilling", contract DE-FC26-04NT15502, with the University of Texas at Arlington. Designed a 3" and 1.69" ultra-high speed (10,000 rpm) version of the patented inverted electric motor (IMe) for drilling. Designed and built a bench prototype of the motor. Determined that tolerances between stator and rotor were too tight at those extremely high rpms for rugged downhole drilling conditions. Completed 2007

Stripper Well Consortium (via US Department of Energy and Penn State University), "Novel SPI Water Mitigation Treatment", contract 3180-IT-USDOE-2098. Further development of the new patent-pending SPI gel technology for water mitigation in oil and gas wells, casing repairs, drilling control problems, construction, and materials preparation. Completed 2007.

Stripper Well Consortium (via US Department of Energy and Penn State University), "Extended Application of a Low Cost Water Mitigation Treatment", subcontract 3022-IT-DOE-2098, with JAG Enhanced Recovery LLC and RTA Laboratory. With the OCAST #077 project below. Developed the new patent-pending SPI gel system for water production mitigation. Completed 2006.

Oklahoma Center for the Advancement of Science and Technology – "Novel Silicate Gels for Casing Repair", project #AR06(2)-077, with RTA Systems Inc. and JAG Enhanced Recovery LLC. Developing and commercializing SPI Gel technology for oil and gas casing, utility conduit repair, construction grouting and materials preparation. Completed 2006.

Stripper Well Consortium (via US Department of Energy and Penn State University), "Design, Construction and Evaluation of an Accurate Low Cost Portable Production Tester", contract DEFC26-04NT42098 and "Construction, Evaluation and Testing of a Portable, Low Cost, Multiphase Tester" 2775-ORI-DOE-2098, with Oak Resources, Inc. and Production Technology Inc. Developed and field tested new test metering equipment for high water cut production wells and drilling processes. This has turned into the Gas-Liquid-Solids (GLS) technology for applications for production and drilling operations. Completed 2005 and 2006.

Stripper Well Consortium (via US Department of Energy and Penn State University) for RTA Systems, Inc with Impact as co-PI, "Novel Paraffin Inhibitor ", through RTA Systems Inc. Developing a new system of paraffin inhibitors for oil wells. Completed.