

## The Next Bigly Thing : Electro-Oil

### *Atlas Burped : Electrical Stimulation of Oil Recovery*

by Robert A. Nelson

It has become unarguably obvious to all but the most recidivist reader (present company excepted, of course), that "fracking" for natural gas is unprofitable, unsustainable, unclean, and it is a direct cause of earthquakes. Card-carrying technocrats everywhere worry over their copies of *Atlas Shrugged* and petition Ayn Rand's ghost to send John Galt. What can we poor corporatist vampires do? Oil is what we do!

Relax! Invest! Redemption is at hand! Here is a sneak peek at the Next Bigly Needful Thing in Petro-Pumping: Electro-Osmosis !

Water in porous material ( e.g., soil or concrete ) is attracted to ground, to the negative electrode. This factoid is used industrially to dewater concrete constructions at a much faster rate.

The same principle applies to oil. Not only is the migration of molecules accelerated, but the overall energy requirements are reduced.

Electrical field treatment of oil in pipelines also minimizes surface tension between the pipe and petroleum, thereby accelerating delivery.

In this same manner, apparently exhausted wells can be rejuvenated in a timely manner, simply by electrically inducing the planet to excrete still more black goo for our Needful Things.

Considerable field research has been performed over several decades to determine the parameters for electro-osmotic production of oil. The required voltage, amperage, waveforms, and frequencies are known, and equipment has been developed to implement the technology.

[Electro-petroleum Inc.](#) is on the pumping edge of this new industry, and proffers a vast opportunity in the hundreds of billions of barrels that can be recovered with their drop-in system. **Electrically Enhanced Oil Recovery** with direct current is a clean, cost-effective alternative to steam.

EEOR has several important advantages over steam-based heavy oil recovery technologies. It can recover oil from reservoirs where steam cannot go. EEOR has no depth limitations, whereas steam-based methods are limited to approximately 2,500 feet -- while over 50% of US heavy oil reserves are below 2,500 feet.

EEOR requires no water or working fluid, and less power. It produces no greenhouse gases. The equipment can be retrofitted to existing wells and operated for less than \$4/barrel. Recovery depends upon resistivity, not permeability, and EEOR increases apparent permeability in the reservoir. EEOR has been demonstrated to increase production tenfold over 18 months in field tests.

The process involves passing direct current electricity between negative electrodes in a producing well and positive electrodes at the surface or at depth.

There are three mechanisms of EEOR in Heavy Oil Recovery:

- (1) Electro-Chemical Upgrading, or Cold Cracking by oxidation and reduction reactions that break down heavy oil molecules into lighter derivatives, thus upgrading the oil in the reservoir.
- (2) Electro-Kinetics or Electro-Osmosis induces oil to migrate toward the negative pole (cathode), creating a flow toward the well.
- (3) Resistance or Joule Heating of oil around the well bore makes it less viscous and easier to extract. Heat is generated directly in the reservoir rather than at the surface.

The technical details are described in US Patents #7325604 (Method for Enhancing Oil Production using Electricity) and WO0303823 (Electrochemical Process for Effecting Redox-Enhanced Oil Recovery)

[Oilrec Technologies / B.S. Geoteknik](#) in Germany has developed a similar electrochemical method for electric enhanced oil recovery by inducing a low electric DC current into the formation that creates redox reactions and geokinetic movement toward the cathode. The redox reactions break down heavy oil into lighter fractions. Full scale field tests have shown that oil with an API gravity of 15 is changed into an API gravity of 39 to 40 over a period of 45 days.

If you need to learn more about electro-osmosis of oil, these patents are available from the wonderful [European Patent Office](#) :

- US3915819 (Electrolytic oil purifying method)
- US2013277046 (Method for Enhanced Oil Recovery from Carbonate Reservoirs)
- US7325604 (Method for enhancing oil production using electricity)
- US2005161217 (Method and system for producing methane gas from methane hydrate formations)
- US2799641 (Electrolytically promoting the flow of oil from a well)
- US3417823 (Well treating process using electroosmosis)
- US3724543 (Electro-thermal process for production of off shore oil through on shore walls)
- US2014116683 (Method for Increasing Bottom-Hole Formation Zone Permeability)
- RU2132757 (Method of Removing Hydrocarbons from Soil)

KR20010086551 (Purification Method of Contaminated Soil with Petroleum Oil)  
RU2602615 (Method of Soil Cleaning from Hydrocarbons)  
KR101464878 (Remediation System for Multi-Contaminated Soils)  
WO2012158145 (Method for Electrokinetic Prevention of Scale Deposition in Oil  
Producing Well Bores)

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