

Kurdistan: From Whipping Boy to World Class Petroleum Province

This overview of the geology and the geopolitical/economic emergence of Iraqi Kurdistan before, during, and after the Iraq War was given by Jim Granath, Vice President, MHA Petroleum Consultants at the DIPS (Denver International Petroleum Society) Meeting that took place at the Wynkoop Brewing Company on October 11th. Jim has a PhD in structural geology and has worked for various companies, including Conoco and Forest Oil, in addition to time as a consultant in Kurdistan.



Kurdistan, which is the traditional homeland of the Kurds, includes parts of Northern Iraq, Eastern Turkey and Syria and North Western Iran. One fifth of the Turkish population is Kurdish. These populations are attempting to reach independence, but the only people that have succeeded are in Iraq where they have formed the Kurdish Regional Government (KRG). The Kurds are not Semites and speak four different versions of their own Indo-European

language. They have a traditional dress described as being similar to an olive green garage mechanics outfit with a sash around their waist. They also wear a distinctive turban.

In the past the Kurds have been part of the Persian and Ottoman Empires, and there are famous Neanderthal sites in the country. After the fall of the Ottoman Empire in World War 1, they came under British mandate. *(After the collapse of the Ottoman Empire, the Allies contrived to create several countries within its former boundaries – according to the never-ratified Treaty of Sèvres, Kurdistan, along with Armenia, were to be among them. However, the reconquest of these areas by the forces of Kemal Atatürk caused the Allies to accept the renegotiated Treaty of Lausanne and the borders of the modern Republic of Turkey – leaving the Kurds without a self-ruled region. Other Kurdish areas were assigned to the new British and French mandated states of Iraq and Syria.)* In the 1930's the Kurds, under the Barzani Clan, rebelled. They became a largely autonomous region during World War II, but were reincorporated into Iraq at the end of hostilities. As a result of rebellions in the sixties and seventies, they became the Kurdish Autonomous Region as part of Iraq. In the 1970's the USA funded their revolt against the Iraqi central government as part of their policies during the Iran-Iraq War. At the end of this war, in 1974, the Kurds were regarded as rebel group by the Iraq Government and treated accordingly. The Kurds reacted with a guerilla war campaign against the genocidal policies of Saddam Hussein. In the 1990's, after Desert Storm and the resulting no-fly zones, the Kurds were able to achieve a measure of independence from Saddam Hussein. The Kurds and Arabs now face each other across the "Green Line" which separates the two regions of Iraq. Under the current constitution, the

President of Iraq (Jalal Talabani) is a Kurd. To further complicate matters, the PKK, the Kurdish Independence Party in Turkey occupies part of Northern Iraq.

Kurdistan is part of the Arabian Plate and is thus a prolific petroleum province. However, under Saddam Hussein, oil development was concentrated in the Arab portion of Iraq and Kurdistan was largely ignored until the area could be brought under Arab control. The older Kurdish Oil Fields like Kirkuk (controlled by Iraq, but claimed by the KRG) and Taq Taq produce oil of around 20 API from the Tertiary and Cretaceous. There are many active oil seeps that flow freely in the summer but are like tar in the winter. The Taq Taq field has a 2P EOR of 607 million barrels from an Eocene Reservoir. It produces 120,000 barrels/day of 24 API oil. Attempts are being made to increase this to 200,000 barrels/day using horizontal drilling techniques. Companies are exploring for deeper Cretaceous reservoirs in this field which contain a lighter, very low gas-to-oil ratio crude with an API gravity of 48 degrees.

Since 2002 there have been discoveries of better quality 40 API oil from the Jurassic and Triassic. Gulf-Keystone Petroleum made one of the initial discoveries and has a share of gross mean oil-in-place resources of at least 19 billion barrels. Ultimate recoverability is difficult to determine because of variable oil viscosity. Most reservoirs are Arabian Plate Carbonates. The limestones are generally dolomitized with secondary porosity. The porosity is highly variable. They can produce with porosities as low as 6%, but Jim has seen 20% porosity at depth.

Beginning in 2002 the KRG has acted as an independent country licensing oil blocks. These licenses are production sharing agreements, not the less attractive service agreements prevalent in southern Iraq. The initial licenses were bought by smaller oil companies, but as reserves have been found, the majors like Exxon and Chevron are moving in. Exxon is in a difficult situation as it has agreements in both regions of Iraq.

The Kurds have a problem exporting their oil as the only pipelines are through the Arab portion of southern Iraq. Rather than export oil through southern Iraq, operators are attempting to build pipelines to connect with an existing pipeline which goes to the Turkish Port of Ceyhan. This Baku-Tbilisi-Ceyhan Pipeline was built to transport oil from the Caspian Sea after the collapse of the Soviet Union.

Jim also provided a geologic overview of the region. To give an idea of the size of the area's resources, Saudi Aramco's Ghawar Field (an anticline above a basement fault block), is the biggest oil and gas reservoir in the world. The field is so large that it is divided into 42 segments with a development team for each segment. Ghawar had produced 65 billion barrels of oil by 2010. Total reserves are estimated at 170 billion barrels. Kurdistan is estimated to have reserves of 45 billion barrels of oil.

As a final remark, to put the current political problems in historical context, Jim mentioned the Battle of Gaugamela between Alexander the Great and Darius III of Persia, which was a decisive victory for the Macedonians and led to the fall of the Persian Empire. The location is accepted as being east of Mosul in northern Iraq.