

Uranium in Central Asia

(August 2009)

- **Central Asia has considerable mineral deposits, including uranium.**
- **Exploration and mine development is proceeding in countries which have not hitherto supplied uranium.**

Please note: The country paper on: [Kazakhstan](#) should be consulted for information in that area.

This paper will deal with other countries in central Asia where uranium deposits having JORC or NI 43-101 compliant resources are known or understood to exist.

Kyrgyzstan

The Mailuu-Suu district, in the Jalal-Abad Province in southern Kyrgyzstan was a significant Soviet uranium mining area where more than 10,000 tonnes of uranium was produced between 1946 and 1967.

Monaro Mining NL has eight exploration licences in the Kyrgyz Republic which are prospective for uranium. These projects include Aramsu, Utor, Naryn, Sumsar, Sogul, Djurasay, Hodjaakan, and Gavasai (the last few including base and precious metals). A number of other companies including Canada's Uranium One are also actively exploring for uranium. Nimrodel has leases in the Mailuu-Suu area.

Monaro in January 2008 signed a memorandum of understanding with Chinese resources group Sinosteel for it to take over exploration of its Kyrgyz projects, under which it could eventually own up to 60% of two new uranium mines in the country.

Several of the licences have CIS (Commonwealth Independent States) defined resources. However, these do not conform to JORC or NI 43-101 standards and a significant amount of further work is required before JORC-compliant resource statements can be reported.

Kyrgyzstan's **Kara Baltinski** Mining Combine processes ore from Kazakhstan's Zarechnoye joint venture at the refurbished Kara Balta mill near Bishkek. It holds a 0.67% share in that JV. The Kyrgyz government accepted a tender from a Russian resources investment group, Renova, for its 72% stake in the company in March 2007, which led to an agreement in October 2008 with the Kazakh-based Eurasian Development Bank (EDB) to provide \$150 million to develop the mill and properly emplace 50 years of tailings accumulation. The mill currently produces about 800 tonnes of uranium and plans to increase this to 2000 t/yr.

Mongolia

According to the 2007 Red Book, Mongolia has 62,000 tU in Reasonably Assured Resources plus Inferred Resources, to US\$ 130/kg U. The mining sector is Mongolia's single largest industry, accounting for 55% of industrial output and more than 40% of export earnings.

Mongolia has a long history of uranium exploration commencing with joint Russian and Mongolian endeavours to 1957. Initial success was obtained in the Saddle Hills area of northeastern Mongolia (Dornod and Gurbanbulag regions) where uranium is present in volcanogenic sediments. However, the country has been considered to have relatively high political risk associated with investment.

The main uranium prospect is the **Dornod** open cut mine in the far northeast of the country, and associated deposits. Two separate deposits were mined by Priargunsky Mining & Chemical Enterprise from 1988 to 1995 and the ore railed 500 km to Krasnokamensk in Siberia for treatment by Priargunsky. About 627 tU was produced.

In 2008 the government established a new Ministry of Minerals and Energy. Then the Nuclear Energy Agency was set up about the beginning of 2009 as a government line agency directly accountable to the Prime Minister. In February 2009 the government set up MonAtom LLC to undertake uranium exploration and mining on behalf of the state, as well as pursuing nuclear energy proposals. It will hold the state's equity in uranium and nuclear ventures and so comes under the Nuclear Energy Agency and the State Property Committee. The Radiation Control Authority is a part of this Agency, along with MonAtom. The existing Mineral Resources and Petroleum Authority of Mongolia (MRPAM) is expected to work closely with MonAtom and the Nuclear Energy Agency.

In mid July 2009, after consultation with the International Atomic Energy Agency, parliament passed a Nuclear Energy Law to regulate the exploration, development, and mining of uranium and give the state a greater degree of ownership and control of uranium resources. It included transitional provisions dealing with existing mining and exploration licences, though as of mid August when the law was to come into effect, these apparently had not been communicated to some companies involved.

In April 2008 Russia and Mongolia signed a high-level agreement to cooperate in identifying and developing Mongolia's uranium resources, and this aimed to restore and consolidate Russia's influence in Mongolia's uranium sector. Russia is also examining the feasibility of building nuclear power plants in Mongolia.

During the visit of the Mongolian Prime Minister to Russia in mid 2009, an agreement was signed between the Mongolian Nuclear Energy Agency and Russia's Rosatom corporation. This agreement envisaged a creation of a joint venture company between MonAtom and ARMZ to develop two uranium mines in Mongolia in which Russia has stakes: Dornod and nearby Mardai, as well as exploring East Gobi further south. A Japanese partner in this joint venture is also envisaged. Rosatom says that the new JV is of particular interest due to its proximity (350 km direct) to Priargunsky operations, allowing creation of a "single infrastructure". Russian aid is expected for railway upgrades throughout Mongolia. The final intergovernmental agreement to set up the 50-50 joint venture - Dornod Uran LLC - was signed on 25 August. The joint venture is to be relieved from taxes and other compulsory payments imposed by Mongolian legislation, because Russian labour is to be used initially.

At least until mid August 2009, the Canada-based Khan Resources Inc. (KRI) owned a 69% share in the Dornod project, mostly through its 58% subsidiary Central Asian Uranium Co. Ltd (CAUC). Russia's Priargunsky Mining & Chemical Enterprise (a subsidiary of ARMZ and Rosatom) and the MonAtom own 21% of CAUC, which holds the only uranium mining licence in Mongolia. A bankable feasibility study has confirmed the viability of the project, the capital cost estimate being US\$ 333 million and first production possibly in 2012. A definitive feasibility study released in March 2009 showed that the project was sound, on the basis of 24,780 tU indicated resources (NI

43-101 compliant), including 20,340 tU probable reserves. Annual production of 1150 tU over 15 years is envisaged. In July 2009 MRPAM suspended for three months the CAUC mining licence due to alleged violations of Mongolian laws. Then in late August the Nuclear Energy Agency announced that the joint venture of MonAtom with Russia's ARMZ would develop the project to produce about 2000 t/yr. Uranium will be exported but not necessarily to Russia.

Khan was granted a 3-year exploration licence from MRPAM early in 2008 covering part of the Dornod orebody, and was applying to have this converted into a mining licence contiguous with that held by CAUC. In addition, Khan holds 100% of an exploration license covering an adjoining "Additional Dornod property". In March 2009 Khan was reported as holding 58% of the No.2 deposit and two thirds of No.7 deposit (via CAUC?), and 100% of the remaining third of the No.7 deposit, giving it 69% of the overall uranium resource. The company was aiming to negotiate an investment agreement with the government as soon as possible, and engineering was then likely to take three years to start up.

Mardai is a deposit close to Dornod, and appears likely to be the first one developed by MonAtom. Uranium mining in Mongolia began 1988 with the Erdes Mining Enterprise, a Russian-Mongolian joint venture which opened the Mardai open pit mine. The ore was railed to Krasnokamensk in Siberia for treatment by the Priargunsky mill until 1993. Total production appears to have been about 600 tU. The town was reported to house 10,000 Russian workers at the mine. There are three separate deposits with the government reporting 60,000 tU.

Gurvanbulag, about 30 km west of Dornod, had extensive underground development down to 560 metres in the Soviet era. It has been held by the Canada-based Western Prospector Group Ltd since 2004 as the main focus of its Saddle Hills project. A recent NI 43-101 inferred resource figure based partly on Russian exploration to 1989 is 9000 tU. Western Prospector and its Mongolian subsidiary, Emeelt Mines, undertook a definitive feasibility study which showed that the project is barely economic, on the basis of 6900 tU reserves averaging 0.137%U. With radiometric sorting the head grade would be 0.152%U and the mine could produce 700 tU/yr for 9 years. Mine development cost would be about US\$ 280 million. It is only 100 km from the Chinese border.

In mid 2008 KRI made a bid to take over the Western Prospector Group so as "to consolidate its position in the Saddle Hills district" but was outbid by Tinpo Holdings, who subsequently withdrew the offer due to political uncertainty. In March 2009 Western Prospector agreed to a US\$ 25 million takeover by China's CNNC International, a 74% subsidiary of CNNC Overseas Uranium Holding Ltd and through it, of SinoU. In June 2009 69% of the shares had been taken over by CNNC. In July MRPAM suspended for three months all of the company's uranium exploration licences due to alleged violations of Mongolian laws, but MonAtom appears to be more positive about Chinese equity here than Canadian involvement.

Canada's Denison Mines has a 70% interest in the Gurvan Saihan Joint Venture (GSJV), with the Government of Mongolia and a Russian partner, and also holds leases through its Mongolian affiliate International Uranium Mongolia XXK (IUM). GSJV has focused on defining ore which is amenable to ISL mining, and it holds interests in several Mongolian properties. In 2007 NI 43-101 resource figures were published for some of these. Indicated and inferred resources of 4400 tU are quoted for Hairhan, and 2400 tU Haraat.

In 2007 Century City entered into an agreement with China Nuclear Energy Industry Corp (CNEIC), a subsidiary of CNNC, to explore and develop uranium resources on its leases in eastern Mongolia.

Red Hill Energy and Mega Uranium hold a number of exploration licences including the Emeelt, Khashaat and Bagamurat deposits 350 km southeast of Ulaan Baatar, and Jargalan, 500 km west of the city.

In December 2008 Japanese trading company Marubeni acquired rights to conduct feasibility studies on three uranium deposits, including Dornod and Gurvanbulag, developed by KRI and Western Prospector, and also Mardai. The company planned to invest US\$ 430 million and had signed a letter of intent with Khan. Since it was perceived that the laws of the mining-dependent country had become increasingly protectionist in recent years, Khan Resources then commented that "We are excited by Marubeni's interest in Khan's Dornod uranium project and are optimistic about the positive influence Japanese investors have on the Mongolian mining investment environment. Marubeni will work to improve the mining investment climate in Mongolia. MonAtom and Rosatom have both said that a Japanese company, presumably Marubeni, may be involved with the Dornod project JV.

Tajikistan

See mention in Uzbekistan, Southern district.

Uzbekistan

According to the 2007 Red Book, Uzbekistan has 111,000 tU in Reasonably Assured Resources plus Inferred Resources, to US\$ 130/kg U. According to the Uzbekistani State Committee for Geology and Mineral Resources (Goskomgeo) in 2008, the country's "explored and estimated uranium reserves" are 185,800 tonnes.

Navoi Mining & Metallurgy Combinat (NMMC) is part of the Uzbekistani state holding company Kyzylkumredmetzoloto, and undertakes all uranium mining in the country. Before 1992, all uranium mined and milled in Uzbekistan was shipped to Russia. Since 1992, all Uzbekistani uranium production is exported to the USA and other countries, through Nukem Inc. A total of 100,000 tU had been produced to the end of 2002. In 2008 South Korea's Kepco signed agreements to purchase 2600 tU over six years to 2015, for about US\$ 400 million.

During the Soviet era, Uzbekistan provided much of the uranium to the Soviet military-industrial complex, with annual production peaking at 3800 tU in mid 1980s. Five "company towns" were constructed to support uranium production activities: Uchkuduk, Zarafshan, Zafarabad, Nurabad, and Navoi, with a combined population of some 500,000. However, uranium industry employment in 2005 was put at about 7000.

NMMC commenced operation focused on uranium and gold at the end of the 1950s in the desert region of Central Kyzylkum province. Early uranium mining was underground (to 1990) and open pit (to 1994), but is now all in situ leach (ISL).

The **Northern** mining district 300 km north of Navoi was established to mine uranium at Uchkuduk, from 1961, by underground and open pit mines, with ore treated at a central plant in Navoi. Since 1965 ISL uranium mining has been used at Uchkuduk and at Kendykijube. There is also sulfuric acid production in the district (possibly in conjunction with a copper smelter). Resources are 51,000 tU.

Resources in the **Zarafshan** (also 'eastern') mining district, about 160 km north of Navoi, are 50,000 tU. Sugraly was mined underground from 1977 and then ISL to 1994, when it was closed.

NMMC had a joint venture with Areva to redevelop the **Sugrally** deposit with reported 38,000 tU resources, but this appears to have lapsed. Sugrally is a thick deposit with complex mining and geological conditions and high carbonate content.

The **Central** mining district #5 at Zafarabad close to Navoi was set up in 1971 by another entity in Bukhara province and became part of NMMC in 1993. It mines the Bukinay group of uranium deposits by ISL methods. Mines include North & South Bukinai, Beshkak, Lyavlyakan and Tokhumbet. District resources are 52,000 tU.

The **Southern** mining district at Nurabad, Samarkand province, was founded in 1964 to mine the Sabirsay uranium deposit by underground methods, which continued to 1983. ISL took over. It was transferred from Tajikistan to NMMC about 1994. Other mines are Ketmenchi (ISL since 1978), Shark and Ulus. Resources are 13,000 tU.

MA#2 at Krasnogorsk previously mined the Chauly uranium deposit but appears to be focused on phosphorite now. It became part of NMMC in 1995.

NMMC has started mining the major new Northern Kanimekh deposit, northwest of Navoi, costing US\$ 34 million. Northern Kanimekh ore occurs 260 to 600 metres deep with 77% of uranium reserves present at 400-500-metre depth. This requires a special approach to building wells and uranium mining process. The startup uranium mining facility at Northern Kanimekh was commissioned in November 2008 and is expected to achieve full capacity in 2012. NMMC has also started building a pilot plant for ISL at Alendy and Yarkuduk deposits. In 2009 NMMC is to start developing mines at deposits Meilysai and Tutlinskaya ploshad costing about US\$30 million. By the end of 2012 NMMC plans to invest US\$165 million in upgrades to expand the existing mining and processing capacities, renew the fleet of process equipment, and establish up to seven new mines. "As part of an increase in uranium production up to 2012, the expansion and reconstruction of sulfuric acid production, at a cost of about \$12 million, will be carried out. Implementation of the program will make it possible to increase uranium production in 2012 by 50%". However, early in 2009 the Uzbek president said that the world economic crisis would slow all this development.

NMMC produced 2320 tU in 2007 from the Northern, Central and Southern mining districts.

In January 2006 a memorandum of understanding concerning the setting up of a Russian-Uzbekistani joint venture for development of Aktau deposit was signed. The Uranium Mining Company (UMC) JV was to comprise Techsnabexport (but ARMZ has since taken over its role) and Rusburmash on the Russian side, and NMMC and Goskomgeo (State Committee for Geology and Mineral Resources of Uzbekistan) on the Uzbekistani side. Initially, it was planned that the joint venture would start operations late 2006, then late 2007, but at the end of 2008 the parties had still not reached the final agreement on setting up the joint venture. Aktau's probable resources are estimated 4,400 tons of uranium accessible by ISL and with treatment of 300 tU/yr production at Navoi. However, the ore is complex and this has apparently delayed establishment of the project.

In September 2006 a Japan-Uzbek intergovernmental agreement was aimed at financing Uzbek uranium development and in October 2007 Itochu Corporation agreed with NMMC to develop technology to mine and mill the black shales, particularly the Rudnoye deposit, and to take about 300 tU/yr from 2007. A 50-50 joint venture was envisaged.

In mid 2008 Mitsui & Co. signed a basic agreement with the Uzbek government's Goskomgeo

(State Geology and Mineral Resources Committee) to establish a joint venture for geological investigations regarding the development of black-shale uranium resources at the Zapadno-Kokpatasskaya mine, 300 km NW of Navoi.

In mid 2009, and further to an April 2007 MOU, Goscomgeo and the Japan Oil, Gas and Metals National Corporation (JOGMEC) signed an agreement for uranium and rare earths exploration in the Navoi region, focused on ISL-type sandstone deposits and black shales, with a view to a Japanese company taking a 50% interest in any resources identified and developing them.

In August 2009 Goscomgeo and China Guangdong Nuclear Uranium Corp. (CGNURC) set up a 50-50 uranium exploration joint venture: Uz-China Uran, to focus on the black shale deposits in the Boztauskaya area of the Navoi region.

In 2007 Russia offered to enrich Uzbekistan uranium in the International Uranium Enrichment Center in Angarsk.

The Uzbekistani State Committee for Safety in Industry and Mining (Gosgortekhnadzor) supervises ministries engaged in mining. The Nuclear Regulations Inspectorate under Gosgortekhnadzor has responsibility for the control and supervision of the research reactors and all nuclear and radioactive materials (including spent fuel) in Uzbekistan.

Main References:

OECD NEA & IAEA, 2008, *Uranium 2007: Resources, Production and Demand ("Red Book")*

[NMMC web site](#)

Reports for Western Prospector Group and Denison Mines

<http://www.mining.mn/?mcmodule=news&newsid=1297>