Technical Meeting on the Establishment of a Regulatory Forum for Safe Management of Uranium and Naturally Occurring Radioactive Material Residues
Vienna, Austria, 18–22 June 2018

SAFETY INFRASTRUCTURE FOR URANIUM PRODUCTION IN MONGOLIA

COUNTRY: MONGOLIA
PRESENTER: N.OYUNTULKHUUR, NEC
DISTRIBUTION MAP OF MAIN MINERAL DEPOSITS and OCCURRENCES IN MONGOLIA
CURRENT STATUS OF GEOLOGICAL SURVEY, EXPLORATION AND MINING LICENSES

(Total: 3322 active licenses as of May 2018;)

(1683 exploration 1639 mining)
URANIUM EXPLORATION AND DEVELOPMENT HISTORY

- **Late 1940s**: Thematic researches
- **1973 – 1975**: Airborne radiometric survey
- **1976 – 1982**: Surface drilling discovers U deposits
- **1983 – 1989**: UG exploration of deposits
- **1988 - 1995**: Production from Dornod open pit
  - 1994-1998: ISL testing at Haraat, Hairhan U deposits
- **2000 – present**: Mineral License issuing / exploration on new areas / resource recalculation for abandoned deposits
- **2010**: ISR test at Dulaan Uul deposit
- **2018**: Construction of pilot plant for ISR test for Zuuvch ovoo deposit

Currently, there are no mining activities
POTENTIAL URANIUM BEARING METALLOGENIC PROVINCES OF MONGOLIA
# URANIUM DEPOSITS

<table>
<thead>
<tr>
<th>№</th>
<th>NAME OF THE DEPOSIT</th>
<th>LOCATION</th>
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<tbody>
<tr>
<td>1</td>
<td>MARDAIN GOL</td>
<td>Dornot Gurvanzagal</td>
</tr>
<tr>
<td>2</td>
<td>NEMER</td>
<td>Dornot Gurvanzagal</td>
</tr>
<tr>
<td>3</td>
<td>DORNOT</td>
<td>Dornot Dashbalbar</td>
</tr>
<tr>
<td>4</td>
<td>ULAAN</td>
<td>Dornot Dashbalbar</td>
</tr>
<tr>
<td>5</td>
<td>GURVANBULAG</td>
<td>Dornot Bayandun</td>
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<tr>
<td>6</td>
<td>HARAAT</td>
<td>Dornogobi, Dundgobi</td>
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<td>7</td>
<td>HAIRHAN</td>
<td>Dundgobi Ulziit</td>
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<td>GURVANSAIHAN</td>
<td>Dundgobi Gurvanaihan</td>
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<tr>
<td>9</td>
<td>ULZIIT</td>
<td>Suhbaatar Tuvshinshiree</td>
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<tr>
<td>10</td>
<td>DULAAN UUL</td>
<td>Dornogobi Ulaanbadrah</td>
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<tr>
<td>11</td>
<td>ZUUVCH OVOO</td>
<td>Dornogobi Ulaanbadrah</td>
</tr>
<tr>
<td>12</td>
<td>ENGER AR</td>
<td>Tuv Bayan</td>
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URANIUM SITES

Map showing uranium sites in Mongolia, including Ulaanbaatar and surrounding areas.
Facilities and sites in the past:

- Uranium production in Mongolia started with operation of the Dornod open pit mine in the Mardai gol district in 1989, based on the Gurvanbulag deposits.
- About 450 thousands of ores, containing 500 tonnes of uranium mined in this district have been transported by rail to Priargun mining and processing plant in Krasnokamensk, Russia, for processing. And uranium production was terminated in 1995.
- UG mine (3 mining shafts for operation built by Russian team)
GURVANBULAG MINE SITE

>13 000m in total (shafts and tunnels)

Main shaft area ~0.44 μSv/h

Ore pile >3.00 μSv/h

Core samples after wildfire
MARDAIGOL MINE SITE

Several hundred meters of shafts and underground tunnels

Main shaft area ~0.40 μSv/h

Core samples ~0.39 μSv/h
DORNOD MINE
SITE

~7 000m total length of shafts and tunnels

Open pit
>100m

Low grade dumps for leaching

Shafts
(4-7m; 325-581m)

~7 000m total length of shafts and tunnels

Shafts
(4-7m; 325-581m)
Current activities

as of May 2018:

- 30 licenses issued /11 companies/:
- 21 exploration licenses /7 companies/,
- 9 mining licenses /4 companies/ :

- “Badrakh Energy” LLC, “Gurvansaikhan” LLC, where 34% owned by Mongolian government company MONATOM, planning to start mining by ISL method by 2020.
- Currently, no uranium is being produced in Mongolia and Mongolia does not have a uranium enrichment and Re-enriched tails industry.
- However, a number of mines are in the planning stage of development.
A total of 30 uranium exploration and mining licenses were issued in Mongolia, as of February 2018.
Current status

PROJECTS PROGRESS

- Dulaan uul
- Zuuvch ovoo
- Kharaat
- Khairhan
- Gurbansaikhan
- Ulziit
- Gurvanbulag
- Dornod

Exploration

Resource estimation

Conceptual study

Mining license

DFS

Environmental study

Deposit agreement

Tests, Procurement, Construction

MINING

✔️ Information gathering

✔️ Decision making
Legislation and Regulatory Framework for Uranium Production

STATE POLICY

- Mongolian Sustainable Development Concept 2030
  /Parliament Resolution, No.19, 02 February 2016/

- State Policy of Mongolia on the Exploitation of Radioactive Minerals and Nuclear Energy
  /Parliament Resolution No.45, 25 June, 2009/

- Program for Implementation of the State Policy
  /Government Resolution no.222, 22 July, 2009/

- Program for Implementation of International Cooperation
  /Government Resolution, 06 July, 2010/

- Action plan of the Government of Mongolia for 2012-2016
  /Parliament Resolution, no.37, 2012/
Legislation and Regulatory Framework for Uranium Production

Legislation related to uranium mining

- Nuclear Energy law (2009)
- Mineral law (2015)
- Law on Environmental Protection (1995)
- Law on Licensing for Business Activity (2001)
- Law on Environmental Impact Assessment
- Law on Waste
- Law on Water
- Law on Water Pollution Fees
Regulations:

Basic regulation on radiation protection and safety (2016)
Radiation safety standard (2015) based on IAEA GS-R Part 3
Regulation on security of radiation sources (2015)
Safety regulation on exploration of radioactive mineral (2015)
Regulation on management of radioactive waste from mining and milling of ores (2015) based on IAEA guidance
Regulation on internal control of licensee (2015)
Radiation safety regulation for uranium mining and milling (May, 2018)
Drafted regulations:
- Regulation for the Safe Transport of Radioactive Material based on IAEA SSR-6, 2012

Regulations developed /drafted/ under the EU project are:
- NORM regulation
- Waste management regulation

Standards:
- MNS on technical requirements for acid in situ leach uranium mining (2015)
- Transport regulation for radioactive material (1987) /new draft prepared/
- MNS on packaging requirements for transportation of radioactive material, (General technical requirements) /2011/
Governmental and Regulatory bodies for Uranium mining

Mining/exploration license:

- Mineral Resources and Petroleum Authority
- Ministry of Mining
- Nuclear Energy Commission
- General Agency for Specialized Inspection (GASI)
- Central intelligence authority
- Ministry of Environment and Tourism
Licensing

- Types of licenses

Mineral resources and petroleum authority issues according to the Mineral law and Nuclear energy law following licenses:

- 15.2.1. Prospect and explore radioactive minerals;
- 15.2.2. Exploit radioactive minerals;
- 15.2.3. Import, export and transport radioactive minerals, disposal of radioactive waste, remediation after exploitation of radioactive minerals. (Nuclear energy law)
REGULATORY CONTROL

- Nuclear Energy Commission
  - Safeguard
  - Licensing of nuclear facilities and activities
  - Safety assessment
- Nuclear and Radiation Regulatory Department of the GASI:
  - Safety assessment of applications
  - Licensing for radiation sources
  - Provide permission for uranium mining activities
  - Inspection
  - Enforcement
• Developed a new regulations and guidance are based on the IAEA BSS and EU guidance;
• Mining is one of potential economy sector in Mongolia
• As of May, 2018 there are 3322 active licenses (1639 of them are exploration license and others for mining)
• NORM regulations and Waste management regulations have been drafted based on international best practices under the EU project, but not submitted.
• National policy of RAWaste management and NORM is under the drafting stage
• Working group responsible to developing of amendment to the Nuclear Energy Law has been established by the prime minister in 2018.
Challenging issues and needs:

- Remediation issues from past practices
- NORM workplaces has not been identified.
- National policy on RAWaste management and NORM has not been established
- Waste management and NORM regulations not established yet
- Needs expert and training assistance for regulatory control for uranium mining and NORM workplace identification
- Needs review of legislation
Thank you for your attention

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