**Transboundary Aquifer Information Sheet**

**AS103 - Ulz River Basin**

**Geography**
- Total area TBA (km²): 18 000
- No. countries sharing: 2
- Countries sharing: Mongolia, Russian Federation
- Population: 63 000
- Climate Zone: Semi-arid
- Rainfall (mm/yr): 350

**Hydrogeology**
- Aquifer type: Multiple-layered hydraulically connected
- Degree of confinement: Aquifer mostly unconfined, but some parts confined
- Main Lithology: Sediment – sand

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**Map and cross-section are only provided for illustrative purposes. Dimensions are only approximate.**
## TWAP Groundwater Indicators from Global Inventory

<table>
<thead>
<tr>
<th></th>
<th>Mongolia</th>
<th>Russian Federation</th>
<th>TBA level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recharge (mm/y/11)</td>
<td>6</td>
<td>7500</td>
<td></td>
</tr>
<tr>
<td>Renewable groundwater per capita (m³/y/capita)</td>
<td>100</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Natural background groundwater quality (%)</td>
<td>100</td>
<td></td>
<td>&lt;5</td>
</tr>
<tr>
<td>Human dependency on groundwater (%)</td>
<td>0</td>
<td></td>
<td>B</td>
</tr>
<tr>
<td>Groundwater depletion (mm/y)</td>
<td>1</td>
<td></td>
<td>D</td>
</tr>
<tr>
<td>Groundwater pollution (%)</td>
<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Population density (Persons/km²)</td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Groundwater development stress (%)</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transboundary legal framework (Scores)</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transboundary institutional framework (Scores)</td>
<td>6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) Recharge: This is the long term average recharge (in m³/yr) divided by the surface area (m²) of the complete country segment of the aquifer (i.e. not only the recharge area).

(2) Natural background groundwater quality: Estimate of percentage of surface area of aquifer where the natural groundwater quality satisfies local drinking water standards.

(3) Groundwater pollution: A. No pollution has been identified; B. Some pollution has been identified; Positive number: Significant pollution has been identified (% of surface area of aquifer).

(4) Groundwater development stress: Annual groundwater abstraction divided by recharge.

(5) Legal framework: A. Agreement with full scope for TBA management signed by all parties; B. Agreement with limited scope for TBA management signed by all parties; C. Agreement under preparation or available as an unsigned draft; D. No agreement exists, nor under preparation; E. Legal Framework differs between Aquifer States (see data at National level).

(6) Institutional Framework: A. Dedicated transboundary institution fully operational; B. Dedicated transboundary institution in place, but not fully operational; C. National/Domestic institution fully operational; D. National/Domestic institution in place, but not fully operational; E. No institution exists for TBA management; F. Institutional Framework differs between Aquifer States (see data at National level).

X A value was provided in the questionnaire, but it was considered un-realistic and therefore removed from the table.

### Key parameters table from Global Inventory

<table>
<thead>
<tr>
<th>Distance from ground surface to groundwater table (m)</th>
<th>Depth to top of aquifer formation (m)</th>
<th>Full vertical thickness of the aquifer (system)* (m)</th>
<th>Degree of confinement</th>
<th>Predominant aquifer lithology</th>
<th>Predominant type of porosity (or voids)</th>
<th>Secondary Porosity</th>
<th>Transmissivity (m²/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mongolia</td>
<td>16</td>
<td>20</td>
<td>25</td>
<td>Aquifer mostly unconfined, but some parts confined</td>
<td>Sediment - Sand</td>
<td>High primary porosity fine/medium sedimentary deposits</td>
<td>200</td>
</tr>
<tr>
<td>Russian Federation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Including aquitards/aquicludes

X A value was provided in the questionnaire, but it was considered un-realistic and therefore removed from the table.
As most of the information was provided by Mongolia, most of the values within this brief refer to the portion of the TBA within Mongolia.

**Aquifer description**

**Aquifer geometry**
This aquifer is a multiple-layered hydraulically connected system with 2 main layers. The aquifer is mostly unconfined, but some parts are confined. The average depth to the water table is 16 m, and the average depth to the top of the aquifer is 20 m while the average thickness of the aquifer system is 25 m.

**Hydrogeological aspects**
The predominant aquifer lithology is sediment—sand that has a high primary porosity with secondary porosity: weathering. It furthermore has a high horizontal and vertical connectivity. The average transmissivity value is 200 m²/d. The average recharge into the system is 13.7 Mm³/yr and the aerial extent of the major recharge area is over 458 km² (see appendix). The long-term trend of the water level shows no signs of groundwater depletion over the system.

**Linkages with other water systems**
The predominant source of recharge is through precipitation over the aquifer area. The predominant discharge mechanism within Mongolia is through river base flow.

**Environmental aspects**
Within Mongolia the natural groundwater quality of the water is suitable for human consumption and no natural pollutants have been detected. Furthermore no anthropogenic groundwater pollution has been identified. Around 25% of the aquifer within Mongolia is characterised by shallow groundwater whereas no groundwater dependent ecosystems over the aquifer were recorded.

**Socio-economic aspects**
A total amount of 0.32Mm³ of groundwater was abstracted from the system during 2010 within Mongolia and this is the sole source of fresh water supply within aquifer area.

**Legal and Institutional aspects**
According to Mongolia a Bilateral Agreement with limited scope for TBA management has been signed by all parties but no Transboundary Institute has been established. The National institution is in place, but is not fully operational.

**Emerging Issues**
Transboundary institutional development is possibly in need of support. The total amount of groundwater within the system needs to be reviewed.

### Contributors to Global Inventory

<table>
<thead>
<tr>
<th>Name</th>
<th>Organisation</th>
<th>Country</th>
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<th>Role</th>
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<td>Contributing national expert</td>
</tr>
</tbody>
</table>
Considerations and recommendations

Most data in the tables and text above have been provided by national and regional experts (listed above) or have been derived from the global WaterGAP model. See colophon for more information, including references to data from other sources.

One of the TBA countries contributed to the information. The information was adequate to describe the aquifer in general terms. Quantitative information was also available, and the indicators at the national level could also be calculated. The total groundwater volume should be revised.

Data gaps and also differences between data from national experts (Global Inventory) and data derived from WaterGAP highlight the need for further research on transboundary aquifers.

Appendix: AS103

Map showing the main Recharge zone within the Mongolian side of the Ulz River Basin TBA

Colophon

This Transboundary Aquifers information sheet has been produced as part of the Groundwater Component of the GEF Transboundary Water Assessment Programme (GEF TWAP). GEF TWAP is the first truly global comparative assessment of transboundary groundwater, lakes, rivers, large marine ecosystems and the open ocean. More information on TWAP can be found on: www.geftwap.org. The Groundwater component of TWAP carried out a global comparison of 199
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Transboundary aquifers and the groundwater systems of 41 Small Island Developing States. The data used to compile this transboundary aquifer information sheet has been made available by national and regional experts from countries involved in the TWAP Groundwater project. For aquifers larger than 20,000 km² and which are not overlapping, additional data are available from modelling done by the Goethe University Frankfurt (Germany) as part of TWAP Groundwater. All data were compiled by UNESCO-IHP and the International Groundwater Resources Assessment Centre (IGRAC – UNESCO Category II Institute). Values given in the fact-sheet represent an approximate guide only and should not replace data obtained from recent local assessments. The editors of this information sheet are not responsible for the quality of the data.

For more information on TWAP Groundwater and for more data, please have a look at the TWAP Groundwater Information Management System which is accessible via www.twap.isarm.org or www.un-igrac.org.

**Request:**
If you have additional data or information about this transboundary aquifer that can improve the quality of this information sheet and the underlying database, please contact us via email at info@un-igrac.org. If appropriate, the information will be uploaded to the database of transboundary aquifers and will also be used in new versions of this information sheet.

**References:**
- Climate: Climate indicates the major climate zone which occurs in the aquifer area. If more than 1 climate zone is present the zone with the largest surface area was selected. Source climate data: ArcGIS Online (2015), Simplified World Climate zones. Owner: Mapping Our World GIS Education. Original map: National Geographic World Atlas for Young Explorers (1998).
- All other data: TWAP Groundwater (2015).

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