Project Design Document
for AusAID Funding to

Strengthen Groundwater Management in Southern Mongolia

February 10, 2012

Abbreviations and Acronyms

AA	Administration Agreement
AMOR	Aquifer Management Organization
AusAID	Australian Agency for International Development
DA	Designated Account
ESMF	Environmental and Social Management Framework (for the MINIS)
FDI	Foreign Direct Investment
FO	Finance Officer
GIS	Geographic Information System
GOM	Government of Mongolia
GPS	Global Positioning System
GW	Groundwater
GWMATE	Groundwater Management Advisory Team (World Bank)
GWMIU	Groundwater Management and Information Unit
GWMP	Groundwater Management Plan
GWMON	Groundwater Monitoring Plan
I&C SYSTEM	Information and Communication System
IWRM	Integrated Water Resource Management
MINIS	Mining Infrastructure Investment Support Project
MMRE	Ministry of Mineral Resources & Energy
MNET	Ministry of Nature, Environment & Tourism
MOF	Ministry of Finance
MPRP	Mongolian People's Revolutionary Party
MRTCUD	Ministry of Roads, Transport, Construction & Urban Development
NDIC	National Development & Innovation Committee
NWC	National Water Committee
OA	Operating Account
PAD	Project Appraisal Document (for the MINIS Project)
PIM	Project Implementation Manual
PMU	Project Management Unit (for the MINIS Project)
PO	Procurement Officer
PSC	Project Steering Committee
SGR	South Gobi Region
SMIS	Southern Mongolia Infrastructure Strategy
SPC	State Property Committee
SUR	Sustainability, Upscalability, Replicability
TT	Tavan Tolgoi (Coal Mine)
WA	Water Authority
WBA	Water Basin Administration
WBC	Water Basin Council
WWF	World Wildlife Fund

Contents

Project Design Document for AusAID Funding: Strengthening Groundwater Management in Southern Mongolia

This document has been prepared to request funding from the Australian Agency for International Development (AusAID) to establish and make operational a new institutional framework to strengthen the management of largely non-renewable groundwater resources in Southern Mongolia. The framework is part of a Government approved, integrated approach to better manage the country's surface and groundwater resources, which will be critical to the country's inclusive and sustainable development.

Section 1. Executive Summary

Background. The Government of Mongolia (GOM) is placing a high priority on bringing new strategic mineral deposits into production, as quickly as possible. While attention has long centred on devising appropriate legal and regulatory frameworks to govern the extraction of mineral resources and on concluding investment agreements with mining firms, far less focus has been given on the availability of water to support the development of mines, and how to ensure its equitable and sustainable use for all stakeholders. The Ministry of Nature, Environment and Tourism (MNET) recognises that better water management is essential to the Government's long-term plans to develop the mining sector. As such, MNET has prepared a national strategy and structure for introducing an integrated approach to managing the country's water resources.

There are many institutions involved in the water sector, but there is no comprehensive policy governing the sector, or single body coordinating surface and groundwater management in Mongolia. Neither the mechanisms to manage large-scale surface and groundwater use, nor the capacity to monitor and enforce laws are currently in place. A key constraint to better management is the lack of capacity and financial resources. For example, the local Department of the Environment and Tourism in the Aimag capital of Dalanzadgad (located in Southern Mongolia) is responsible for implementing and enforcing laws and regulations pertaining to the environment, including groundwater issues, tourism and wildlife. To do so, they have four staff, an annual budget of about US$70,000, and an area to patrol that covers some 350,000 square kilometres. This is typical of local Departments of the Environment and Tourism countrywide.

In 2004, the Government of Mongolia adopted the water basin approach for managing its surface and groundwater resources, which is an essential first step to introducing an integrated approach to managing water resources throughout the country. The Government is in the process of establishing its new institutional framework, including basin level water management organisations that would consist of Water Basin Councils (WBC), and Water Basin Administrations (WBAs). Together, these organisations would form the principal organizations for Integrated Water Resources Management (IWRM) in a basin.

The WBCs would act as the basin level coordinating bodies, in which all relevant stakeholders and actors would be represented to voice and protect their interest in water resources in the basin, while the smaller WBAs would have full-time staff to carry out daily management tasks. While WBCs have been established at a couple of basins, there are no functioning WBAs.

MINIS and AusAID Program. In May 2011, the World Bank's Board of Executive Directors approved a US$25.00 million Credit to facilitate investments in infrastructure to support mining and downstream processing activities in Mongolia, regardless of funding source, and to build local capacity to prepare and transact infrastructure projects. The Mongolian Parliament subsequently ratified the Credit in July 2011. The Mining Infrastructure Investment Support Project (MINIS) consists of the following four components:

- Component 1: Support for Infrastructure Investments (US$19.69 million);
- Component 2: Capacity Building and Knowledge Transfer (US$1.45 million);
- Component 3: Strengthening Groundwater Management (US$3.23 million); and
- Component 4: Project Management (US$0.63 million).

The AusAID Program will implement the activities associated with Component 3 as a grant under the MINIS, which will seek to strengthen the capacity of authorities to manage groundwater resources, as well as the capacity of the Water Authority (WA) to support those local authorities, and consolidate a database of information on groundwater in southern Mongolia. This would be done as co-financing through a trust fund agreement between the World Bank and AusAID.

The amount of the AusAID Program is US$7.43 million, and when combined, the overall amount of the MINIS and AusAID Program would be US$32.43 million. The original 3M allocated to Component 3 will be reallocated to feasibility studies. It is worth noting that the $3.23 million that has been allocated to implement Component 3 under the MINIS is less than what's required to pilot the preferred institutional structure to manage groundwater. The higher amount of AusAID funding for Component 3 reflects a more rigorous institutional structure, as well as better cost estimates of the groundwater-related studies that will be carried out during implementation.

The AusAID funding would be used to pilot a new institutional structure to be piloted in the three Aimags of Dornogovi, Omnigovi and Dundgovi, and which will have a socially-sustainable and participatory approach. A framework, including a mandate and staffing needs, has been defined and will be made operational. Under the AusAID Program, one WBC and three WBAs will be established in each of the three Aimags. In addition, a small Groundwater Management and Information Unit (GWMIU) will be established at the WA to ensure proper coordination of activities. Staff of the GWMIU and WBAs will be interdisciplinary, covering both the technical and socio-economic dimensions. This will also contribute to identifying poverty issues in the groundwater-using communities and propose counteractive measures within the realm of water supply. To support gender equality, the Socio-Economic Development Specialists at the WBAs will consider gender-specific impacts in the development of management and monitoring plans, inclusion of gender perspectives in data collection and user profiles and preference to qualified female applicants for these positions should be encouraged.

The GWMIU will support the WA with the following activities:

- Playing the role of focus operational counterpart to consultants;
- Providing technical and socioeconomic guidance of the three WBAs;
- Consolidating the databases of the three WBAs into the WA's existing database
- Consolidating the GWMP for the SGR;
- Preparing a general framework for managing non-renewable groundwater resources in the SGR; and
- Operating the I&C System.

The staff of the GWMIU will consist of: (i) a Senior Hydrogeologist; (ii) GIS Database Specialist; and (iii) Socio-Economic Development Specialist. It is expected that the WA will provide the administrative and secretarial support for the GWMIU.

The WBC will act as the coordinating body through which all relevant stakeholders and actors Southern Mongolia will be represented to voice and protect their interest in groundwater management in their respective basins. Composition of the WBC will include a Chairman, Secretary and up to 15 members representing key stakeholders in the three Aimags in which WBAs will be established. The

Chairman of the WBC will be elected from among its members and will need to be approved by MNET, as specified in the Water Law of 2004. The Chairman should participate in yearly meetings organized at national level by the National Water Committee and/or the WA. This would allow for groundwater concerns to be expressed at the national level, which could then be reflected in policy making.

Given the key role of the WBC in overseeing the process for strengthening groundwater management in Southern Mongolia, it should be established as soon as possible. It is envisaged that the WBC will hold "rotational meetings" in the three capital cities that have WBAs. The role of the WBC in coordinating dialogue among numerous stakeholders will be challenging, relevant and have an impact on groundwater policy at the national level that may drive groundwater abstraction and pollution rationalization.

WBAs will be established in the three Aimag capitals of:

- Sainshand, capital of Dornogovi (East Gobi);
- Dalanzadgad, capital of Omnigovi (South Gobi); and
- Mandalgovi, capital of Dundgovi (Middle Gobi).

WBA staff, which will be financed by AusAID, for each of the three WBAs will include:

- Director/Senior Hydrogeologist;
- Water Quality Engineer;
- Water Engineer;
- GIS Database Specialist;
- Socio-Economic Development Specialist; and
- Driver.

The tasks and responsibilities of the WBAs will include data management, planning, groundwater research, and other activities. More specific activities will include: (i) gathering and assessing existing groundwater data; (ii) carrying out additional groundwater investigations; (iii) implementing demand assessments and resource studies; (iv) developing groundwater management and monitoring plans; (v) preparing assessments on options for identifying a sustainable source of revenue to make the new structures operations sustainable.

To attract qualified specialists to work in the WBAs, compensation levels higher than prevailing civil service standards will be offered. Addition incentives, such as participation in international training and conferences on relevant topics, and participation in other short courses offered private mining companies and donors, will be a part of compensation packages. It is worth noting that there is a steady stream of students returning to Mongolia to take advantage of the economic opportunities that are emerging in the country.

To make the WBC and WBAs operational, furnishings and equipment, including field equipment and three vehicles, will be financed under the AusAID Program.

Implementation Arrangements. The same institutional arrangements that are used by the World Bank to manage trust funds on behalf of other donors would apply to the AusAID Program. The World Bank will serve as administrator of the AusAID funds and be responsible for overall management of the Program. An Umbrella Trust Fund arrangement between the World Bank and AusAID should be set-up to facilitate any future AusAID contributions for Mongolia to be managed by the World Bank.

It is expected that the AusAID Program will be implemented over a four and one-half year period between April 1, 2012 and September 30, 2016, the expected closing date of the MINIS.

Based on receiving AusAID's approval for the Program by March 31, 2012, the expected milestones for establishing key groundwater entities include:

- WBC established and Director appointed (June 30, 2012);
- GWMIU established, staffed and functional (August 31, 2012); and
- Three WBAs established, staffed and functional (September 30, 2012).

A core team of World Bank specialists has been assigned to oversee and supervise the Program during implementation, ensure that funds are used for their intended purpose and within the allocated budget, and provide regular updates on progress. The core team consists of a Task Team Leader, a Procurement Specialist, and a Financial Management Specialist. In addition, the World Bank's Trust Funds Department in Washington, DC will monitor Program activities, while the Loan and Disbursements Team in Manila, Philippines will ensure that all required documentation is available before releasing AusAID funds.

The Ministry of Finance (MOF) is the implementing agency for both the MINIS and the AusAID Program. A Project Management Unit (PMU) has been established at the MOF, and will manage the MINIS and the AusAID Program on behalf of project beneficiaries from other ministries and agencies. The PMU will be responsible for: (i) procurement of all services, goods and equipment; (ii) financial record keeping, reporting and disbursements; (iii) project monitoring and reporting; and (iv) the contractual obligations. The WA, which is an agency of the MNET, will have responsibility for implementing all technical aspects of the AusAID Program.

It is expected that AusAID officials will participate in implementation when possible, including in missions to supervise the Program, commenting on outputs produced by consultants and specialists, participating in any workshops that might be organised and meeting with the World Bank regularly to discuss implementation progress.

Section 2. Analysis and Strategic Content

2.1. *Country and Sector Issues*

Country Issues

Mongolia's mining sector is a major contributor to the economy. It accounts for about one-third of the country's economic activity, some 85 percent of exports, and generates nearly 40 percent of government revenue. Foreign direct investment (FDI) in the sector currently accounts for nearly 80 percent of total FDI, and this is expected to climb in the coming years. It is widely recognised that the country's wealth of mineral resources offers perhaps its greatest potential for economic growth and development.

The Government of Mongolia (GOM) is placing a high priority on bringing new strategic mineral deposits into production, as quickly as possible. In October 2009, an Investment Agreement was signed with Ivanhoe Mines to develop the Oyu Tolgoi copper and gold mine, and the Government is seeking to move forward rapidly with investment agreements to develop the Tavan Tolgoi (TT) coal mine. In March 2011, six groups were shortlisted to develop part of the massive TT coal field. Although an agreement has not been concluded, one is expected by Spring 2012. Additional agreements at other possible mine sites are under varying stages of development.

Most of the areas with large mineral reserves are remote, lack appropriate access infrastructure, and are without dependable utility services, including power, water and heat. For mines to become fully operational, an array of infrastructure facilities and services will be required. Both mining operations and large-scale infrastructure require significant amounts of water during construction and operation.

While attention has long centred on devising appropriate legal and regulatory frameworks to govern the extraction of mineral resources and in concluding investment agreements with mining firms, far less focus has been given on the availability of water to support the development of mines, and how to ensure its equitable and sustainable use for all stakeholders. The Ministry of Nature, Environment and Tourism (MNET) recognises that better water management is essential to the Government's long-term plans to develop the mining sector. As such, MNET has prepared a national strategy and structure for introducing an integrated approach to managing the country's water resources. The development of effective water management plans and pricing structures will depend on sustained data collection and analyses. However, MNET lacks the financial resources needed to effectively carry this out.

Sector Issues

Many Institutions are Involved in the Water Sector, but Comprehensive Policy Missing. The water sector in Mongolia is institutionally multifaceted and dispersed, especially at the national level, with 13 main agencies and many minor ones involved in various aspects of sector planning and management. There are often overlaps, and sometimes gaps, in responsibilities. There is no single body coordinating surface and groundwater management in Mongolia, although several Ministries and institutes carry out part of the tasks, and no coordination of water management at the Aimag and Soum levels.

Water issues come under the jurisdiction of the MNET. The Water Authority (WA), which is under MNET, is the main implementing agency of the Water Law (2004). At the central level is the National Water Committee (NWC), but its responsibilities and functions are not clear due to lack of legislation. The Ministries of Roads, Transport, Construction and Urban Development, Food, Agriculture and Light Industry, Mineral Resources and Energy, and Health are also involved in aspects of water and its delivery. Although the organisational responsibilities at the national level are formally established, a comprehensive policy on water issues is lacking.

Insufficient Planning. Neither the mechanisms to manage large-scale surface and groundwater use, nor the capacity to monitor and enforce laws are currently in place. Plans to monitor and manage the use of water resources are essential to ensuring that long-term development of mining and other economic activities can occur without endangering supplies to local communities and herders. There has been some improvement with the recent approval of the "National Water Program" (GOM 2010a and GOM 2010b), which is a useful backdrop for preparing groundwater management plans under Activity 6. In addition, the following should be taken into account when developing the management plans:

- Reinforce the fact that development of the mining sector in Southern Mongolia will depend on non-renewable groundwater resources;
- Water resources planning and land use planning must be linked to ensure quality measures are in place to adequately protect groundwater; and
- The link between groundwater and urban development should be made by acknowledging that pragmatic approaches, such as making use of soil and underlying strata treatment capacity and simple wastewater treatment technologies, could be preferable to more sophisticated and expensive technologies adopted from developed nations (Jiménez C 2010, Cisneros BJ 2011, and Crook, et al 2005).

Uneconomic Pricing of Water Resources. The current pricing regime for water resources does not appear to be based on economic principles. A review of Mongolia's water resource pricing principles should be used to set tariffs at levels which encourage appropriate levels of use and recycling, especially for mining activities. In addition, the applicability of creating markets for buying and selling water rights should also be examined, along with creating a reliable water use rights administration and measures to protect vulnerable sectors.

Lack of Capacity and Financial Resources. A key constraint to better management is the lack of capacity and financial resources. For example, the local Department of the Environment and Tourism in the Aimag capital of Dalanzadgad (located in Southern Mongolia) is responsible for implementing and enforcing laws and regulations pertaining to the environment, including groundwater issues, tourism and wildlife. To do so, they have four staff, an annual budget of about US$70,000, and an area to patrol that covers some 350,000 square kilometres. This is typical of local Departments of the Environment and Tourism countrywide and clearly has a detrimental impact on the ability to enforce laws and regulations governing the sector.

Framework for Water Resource Management. In 2004, the Government of Mongolia adopted the water basin approach for managing its surface and groundwater resources, which is an essential first step to introducing an integrated approach to managing water resources throughout the country. The establishment of Water Basin Councils (WBCs) is specified in the Water Law (2004), which further specifies powers of the WBCs. These include assessing water resources, planning for the use of water resources, monitoring and protecting water resources, and conducting appropriate research.

The Water Authority has now identified 29 water basins that cover the entire country. Most of the river basins correspond to, and are aligned with, the natural geographical features of main bodies of surface water. However, for the southern part of Mongolia, these basins are in fact "groundwater basins," as surface water drainage is of minor importance there. For these basins, the WA has agreed to align their boundaries with Aimag boundaries, rather than topographical boundaries as for the surface water basins.

The Dutch government has been working with the GOM to implement an Integrated Water Resources Management (IWRM) Program, which is strengthening the WA's abilities to manage water resources throughout the country. The Government is now in the process of establishing its new institutional framework to manage water resources throughout Mongolia, which is based largely on the IWRM Program being carried out with Dutch assistance. The proposed basin level water management organisations would consist of Water Basin Councils (WBC), and Water Basin Administrations (WBAs). Together, these organisations would form the principal organizations for IWRM in a basin. This proposed structure reflects the institutional organisation at the national level with the NWC, which ideally would be responsible for setting policy at the national level, and the WA, which would provide information and data to the NWC and implement national policy.

The WBCs would act as the basin level coordinating bodies, in which all relevant stakeholders and actors would be represented to voice and protect their interest in groundwater management in their respective basins. The smaller WBAs would have full-time staff to carry out the daily management tasks. They would function as the knowledge and information centre on water issues in the basin and carry out or commission and supervise the supporting studies for policy development and IWRM. The two entities are considered to be equally important, since the WBCs will ensure stakeholder participation and the WBAs will carry out the detailed daily activities, and gather, store and maintain the information on groundwater, and in some cases, surface water.

The proposed institutional structure to strengthen water resource management represents a progression to the practical natural resource management required to accompany mining development throughout Mongolia and help to preserve resources for the traditional pastoral herding community. The Program is an institutional strengthening exercise to fast track the capacity of the Water Authority to address emerging issues regarding competition for water. In devising an appropriate framework to strengthen the management of its water resources, Mongolia is looking to learn from other mining countries with similar challenges, such as Australia, Botswana and Chile.

It is important to note that the legal and institutional framework governing groundwater in Mongolia has not been perfected and that the structure to be piloted under the AusAID Program to strengthen groundwater management at the central and Aimag levels will be designed and implemented within the existing legal framework. These pilots will provide an excellent opportunity to test the real need of legal amendments being considered.

2.2. *Problem Analysis*

The AusAID Program is about access to groundwater resources in Southern Mongolia, and more specifically, the Sothern Gobi Region (SGR). The SGR covers an area of 350,000 km2, and its population in 2007 was 150,000. Average annual rainfall is between 115 mm per year and 150 mm per year, and the resulting recharge is estimated to be just 1 mm per year. Based on existing information, the existence of the following types of aquifers is known:

- Upper streambed aquifers (0 meters to 20 meters)
- Shallow aquifers (20 meters to 50 meters)
- Deeper aquifers (> 50 meters), permeable, productive mainly sandstone formations containing mainly fossil water, surrounded and overlain by less permeable formations, which are local semi-confined aquifers with limited spatial (< 500 km2) and vertical (< 50 meters to 100 meters) extension - pumping may drain the layers above the aquifer and if so, likely cause a lowering of the groundwater table, and eventually the aquifer itself.

The estimated current demand for water in 2010 is:

- Domestic (urban and rural): 3.7 million m3/yr
- Livestock: 11.7 million m3/yr
- Mining industry: 14.6 million m3/yr
- Total: 30 million m3/yr

The estimated demand for water in 2020 is:

- Domestic and livestock: 36.5 million m3/yr
- Mining industry: 109.5 million m3/yr
- Total: 146 million m3/yr to 164 million m3/yr

Based on a 25 year to 40 year abstraction period and a lowering of the groundwater table of between 50 meters and 100 meters per year, the groundwater potential of the SGR is 200 million m3/yr to 500 million m3/yr. For all practical purposes the aquifers must be considered as non-renewable.

A more detailed picture of the spatial (and vertical) distribution of the groundwater (quantity and quality), and of future water demands, its spatial distribution, quality requirements, and the possibilities to increase water use efficiency and water re-use, are required to develop a reasonable groundwater management program. The studies carried out the Oyu Tolgoi copper mine (see Box below) are a good example of what should be done in other areas of the SGR.

Box 2. The Gunii Holoi groundwater assessment study

The Gunii Holoi groundwater investigation and resource assessment study for the Oyu Tolgoi mine (Aquaterra, 2007) provides a good example for the approach in determining the impact of groundwater abstraction, and it provides the information for aiding decision making on the allowable abstraction.

The area of investigation (550 km²) was identified through desk study and an initial exploration and test program. This study provided the basis for a feasibility study the covered the following:

- Surface geophysical surveying,
- Exploration well drilling to provide litho logical information,
- Drilling test production and observation wells for aquifer testing and long-term monitoring,
- Geophysical borehole logging to provide additional lithological data information,
- Pumping tests to determine aquifer characteristics,
- Down-the-hole flow logging to determine the main flow horizons,
- Groundwater sampling and analysis to determine the groundwater quality characteristics,
- A conceptual model and groundwater modeling to simulate abstraction scenarios.

The result of the model runs provided two abstraction scenarios:

- *Scenario 1.* Maximum acceptable drawdown till the top of the main aquifer for 40 years pumping, resulting in an abstraction of 1.325 l/sec;
- *Scenario 2.* Maximum acceptable drawdown corresponding with a 50 percent dewatering of the aquifer, resulting in an abstraction of 3.340 l/sec (40 years pumping).

Scenario 1 was selected for its consistency with Mongolian guidelines for fossil groundwater. The study also provided important information on the possible impacts of groundwater abstraction on the shallow groundwater (herder wells, vegetation, groundwater dependent ecosystems, and downstream users. It showed that this lowering hardly affects the shallow groundwater in herder wells in streambeds (recharged by infiltration of rainfall and run-off). Monitoring during operation of the well field is foreseen to verify this assumption based on field test and modeling results.

Climate models for Asia produced by the International Panel on Climate Change predict that during winter months there will be an increase in precipitation, with the annual precipitation decreasing slightly in the western desert to a slight increase across the steppe area in eastern Mongolia.

The water-related impacts of the climate change models include the prediction that the combination of precipitation decreases and temperature increases will likely reduce the run-off of rivers and cause a decline of lake water levels. With the absence of rivers in Southern Mongolia, these impacts will occur largely outside the SGR.

In the SGR, the expected increase of evaporation of soil moisture (due to temperature increase) is of more importance and may reduce the recharge to the groundwater in the upper aquifers. This may, however, be balanced by higher levels of precipitation. Yet, the impacts of climate change may influence the recharge, and this should be included in further studies that will be needed to get a better understanding of the current recharge rates.

The shallow groundwater constitutes only a small portion of the total groundwater reserves in the SGR. Most of the groundwater is in deeper aquifers and is mainly fossil. This water is not affected by current changes in climate variability since it was recharged under other climatic conditions and is now trapped in the deeper layers.

However, independently of climate change effects, due to the extreme water scarcity in the SGR, water reuse, recycling, and managed recharge are possible options to ensure water security, and they should be investigated.

The main concerns with groundwater in the SGR include salinity and occasional arsenic and fluoride trace elements.

2.3. *Key Lessons Learned*

Important lessons from *in-country activities* related to water resource management include the need to:

- raise awareness for water management at the policy level;
- decentralize management of water resources;
- bring together information on water resources and effectively share it with all stakeholders; and
- improve coordination and build local capacity to effectively manage water resources.

Some key lessons learned from *international experience* would advocate:

- establishing forums in which all stakeholders have a say in how water resources are used and managed;
- ensuring that water management and monitoring plans are dynamic and regularly updated;
- to finance the activities of decentralized water management, securing a source of funds that is not dependent on annual budget allocations;
- preparing training of trainers courses to strengthen management of water resources; and
- promoting sound management practices through targeted public awareness programs.

In the context of the SGR, it is also important to acknowledge that the sustainability of groundwater resources for supplying mines in the SGR is unlikely to be feasible and an approach of "socially-sustainable" groundwater management of non-renewable aquifers should be pursued.

2.4. *Consistency with Existing AusAID and Other Donor/Multilateral Programs*

The World Bank has carried out a number of initiatives and upstream activities on the importance of managing groundwater in Southern Mongolia. These include:

- an environmental assessment for the region (published in January 2010);
- an assessment of groundwater in Southern Mongolia (published in April 2010);
- regional workshops on the importance of groundwater, which were held in Dalanzadgad, Sainshand and Mandalgobi (Southern Mongolia), and Ulaanbaatar in April, June and October 2010; and
- a framework and development plan for strengthening the management of groundwater in Southern Mongolia (published in January 2011).

The intent of these publications and events was to draw focus on the issue of groundwater management. The regional workshops in South Gobi documented the aspirations of the local public sector, private sector and community organisations in the future of the region's groundwater management. The series of consultative events were consolidated into an action plan, which called for:

- improved governmental coordination on managing groundwater;
- investment into local capacity building and institutional strengthening;
- preparation of localised water management plans with local input;
- addressing issues of sustainable water supplies for small and rural communities; and
- assessing water quality and monitoring groundwater use.

Through the series of workshops identified above, these findings were presented to a select audience in Ulaanbaatar to gauge the level of support for further work on groundwater management. The audience included representatives from the Water Authority, Ministry of Nature, Environment and Tourism, National Water Committee, and other government agencies with an interest in groundwater in the region. Representatives of mining interests and civil society organisations were also present. Overall, private sector entities were very supportive of strengthening groundwater management, since good practices are seen to benefit everyone in the industry. The government agencies present also supported the activity as an institutional strengthening activity for the Water Authority.

With the exception of the Government of the Netherlands, which is providing assistance to the Government in the design of a national water resource management plan, and the World Bank, no other donors are actively providing support on this issue.

Government Engagement and Support for the Program. There is strong and growing interest among policy makers, senior government officials and investors alike for improved oversight of groundwater use in southern Mongolia. Both the Minister of Nature, Environment and Tourism and the Chief Operating Officer for Oyu Tolgoi send letters to the World Bank expressing support for the proposed AusAID Program (Annex H). In addition, the Water Authority has expressed the need for guidance and support to improve how it manages water resources. With the exception of the Dutch IWRM Project, little support has been provided in this area and the AusAID Program will fill an important policy gap in Mongolia's economic development. The WA will be expected to establish and staff offices in each of the country's 21 Aimags over the next three years, and the Chairman has acknowledged that there will likely be much to learn from the process of piloting the WBAs in southern Mongolia. The WA is keenly interested in the support from AusAID and has taken the unusual step of directing the Deputy Chairman to oversee its implementation.

2.5. *Rationale for AusAID Involvement*

Australia's aid program currently focuses on human resources development primarily through its scholarships program. Sectorally, natural resource management is a priority, as are both mining and agriculture. Recently, AusAID worked with the World Bank to strengthen governance systems, particularly in relation to mining, and in November 2008, a delegation of prominent Mongolian officials visited several mines in New South Wales and the Pilbera to gain an overview of issues and challenges in providing infrastructure services to support the mining industry, and to better understand how scarce water resources are managed.

AusAID's "*An Effective Aid Program for Australia: Making a Real Difference – Delivering Real Results*," provides a framework for Australia's development assistance. Within the framework there are ten strategic development objectives. The current Australian aid program to Mongolia focuses around five of them:

a) improving public health by increasing access to safe water and sanitation;

b) improving incomes, employment and enterprise opportunities for poor people in both rural and urban areas, including the development of sustainable mining industries to boost overall economic development;

c) improving governance in developing countries to deliver services, improve security, and enhance justice and human rights for poor people; and to improve overall effectiveness in aid delivery in partnerships between host governments and agencies; and

d) enhancing disaster preparedness and delivering fast, more effective responses to humanitarian crises.

This Program will strongly support objectives (b), especially as it pertains to sustainable mining and the approach to address sustainability, scalability, and replicability, and (c) on improving governance by implementing a new institutional structure and carrying out associated capacity building activities. To a lesser extent the Program will support objective (a) by improving management and data collection of groundwater resources in the South Gobi.

Making Every Drop Count: Water and Australian Aid is AusAID's strategy document for water, outlining the critical importance of water governance in addressing the increased demand for limited water resources, and well placed position for Australia to provide advice on this issue and further develop its partnership with the World Bank and Government of Mongolia. Unlike much of the Asia Pacific Region, the water stress that Mongolia experiences is similar to much of the arid areas of Australia. These similar marginal environmental conditions are a challenging backdrop to competition for land and water between mining companies and pastoral communities. The key to finding a balance is effective, contemporary, and informed institutions for governance, with sufficient participation from stakeholders, which is a focus of the strategy. The implications for compromising such a balance are serious and would impact economic growth, since water supply is a critical and immediate constraint to mining activity and the booming population servicing the industry. On the other hand, cultural and economic protection of the herding community is imperative, since they also rely on water resources for their continued survival and way of life. It is essential to ensure that strong and implementable regulatory foundations are developed in the coming years and decades and form the basis of sound water management during the lifetime of large mines, and that environmental sustainability and intra-generational equity is addressed.

Section 3. Program Description

3.1. *MINIS and AusAID Program*

In May 2011, the World Bank's Board of Executive Directors approved a US$25.00 million Credit to facilitate investments in infrastructure to support mining and downstream processing activities in Mongolia, regardless of funding source, and to build local capacity to prepare and transact infrastructure projects. The Mongolian Parliament subsequently ratified the Credit in July 2011. The Mining Infrastructure Investment Support Project (MINIS) consists of the following four components:

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- Component 4: Project Management (US$0.63 million).

The AusAID Program will implement the activities associated with Component 3 as a grant under the MINIS, which will seek to strengthen the capacity of authorities to manage groundwater resources, as well as the capacity of the Water Authority (WA) to support those local authorities, and consolidate a database of information on groundwater in southern Mongolia. This would be done as co-financing through a trust fund agreement between the World Bank and AusAID.

The amount of the AusAID Program is US$7.43 million, and when combined, the overall amount of the MINIS and AusAID Program would be US$32.43 million. It is worth noting that the $3.23 million that has been allocated to implement Component 3 under the MINIS is less than what's required to pilot the preferred institutional structure to manage groundwater. The higher amount of AusAID funding for Component 3 reflects a more rigorous institutional structure, as well as better cost estimates of the groundwater-related studies that will be carried out during implementation.

3.2. *Objective and Goal*

Objective. The objective of the AusAID Program is to implement the activities associated with Component 3 under the World Bank's Mining Infrastructure Investment Support Project (MINIS), which will strengthen the capacity of authorities to manage non-renewable groundwater resources in Southern Mongolia, as well as the capacity of the WA to support those local authorities, and consolidate a database for the Southern Mongolia Region. This would largely be achieved by piloting new institutional structures in three Aimag capitals with important mining and/or planned industrial activities, and by strengthening the WA by establishing a small Groundwater Management and Information Unit.

Goal of AusAID Program. The goal of the AusAID Program is to improve the Government of Mongolia's capacity to sustainably manage its natural resources in the context of rapid economic growth. This would be done by improving the understanding of groundwater resources in southern Mongolia, and devising appropriate policy to ensure its sustainable use and mitigate any negative environment and social impacts as a result of mining sector activities. The Program is focused on upstream results with the aim of improved groundwater resources management at the local and national levels. Principal deliverables would include:

(a) pilot institutional structure for ground water management;

(b) development of policy relevant data on ground water in southern Mongolia;

(c) installation and operation of monitoring equipment; and

(d) establishment of an Information and Communication (I&C) System with technical, socio-economic and institutional information that is linked to the existing WA database and public awareness system.

Description of AusAID Program. AusAID funding would be used to strengthen the capacity of local authorities to manage groundwater resources in Southern Mongolia. A new institutional structure will be piloted at three Aimags in the region (Dornogovi, Omnigovi and Dundgovi), which have fairly small and horizontally independent aquifers that can be managed independently. The management of these non-renewable resources will be piloted in priority areas in each Aimag with a socially-sustainable and participatory approach. A framework, including a mandate and staffing needs, has been defined and will be made operational under this component. Under the proposed framework, one Water Basin

Council (WBC) and three Water Basin Administrations (WBAs) will be established in each of the three Aimags.

The WBC will act as the coordinating body in which all relevant stakeholders and actors will be represented to voice and protect their interest in groundwater management in their respective basins, while the WBAs will consist of a small core team of professional staff to carry out the daily management tasks and function as the knowledge and information center on groundwater issues in their respective Aimags.

To ensure leadership of the entire AusAID Program, and as a first step towards "after-Program" sustainability, the WA will be reinforced by establishing a small Groundwater Management and Information Unit (GWMIU). Given that groundwater management is more about enabling and nurturing interactions among aquifer users, the staff of the GWMIU and WBAs will be interdisciplinary, covering both the technical and socio-economic dimensions. This will also contribute to identifying poverty issues in the groundwater-using communities and propose counteractive measures within the realm of water supply. To encourage gender equality, preference to qualified female applicants for these positions should be encouraged.

To make the WBC and WBAs operational, furnishings and equipment, including field equipment and three vehicles, will be financed under the AusAID Program.

The AusAID Program will seek to address the triple challenge of sustainability, scalability, and replicability (SUR). In an effort to encourage and support sustainability of the new institutional structure, it is expected that the GOM will pay ten percent of Program expenses in 2015, thirty percent in 2016, and 100 percent from 2017 onwards. As such, the AusAID Program will emphasize early implementation of a study to examine possible sources of funding, such as increasing fees to reflect the full economic cost of groundwater use, strengthening the WA's budget from mining industry taxes, and taking advantage of the willingness of national and international mining companies to pay higher consumption-based tariffs, provided the additional monies would be dedicated to sustaining the new groundwater management structure. In addition, the applicability of creating markets for buying and selling water rights should be examined, including the need for establishing a reliable water use administration system and measures to protect vulnerable groups.

The understanding of groundwater resources and its use in Southern Mongolia will be improved by: (a) gathering existing information; (b) identifying gaps and conducting groundwater and water use investigations to complete understanding of groundwater resources; (c) installing and operating monitoring equipment; and (d) establishing an Information and Communication (I&C) System with technical, socioeconomic and institutional information that is linked to the existing WA database and public awareness system. Gathering existing information and conducting investigations will help to identify areas of priority for piloting aquifer management in the three Aimags. An added benefit of an effective I&C System is that they can promote transparency, which helps to reduce corruption and vested interests.

A question that will be addressed under the Program is the relationship, if any, between deep and shallow aquifers, and what influence the abstraction of groundwater from deeper aquifers might have on shallow aquifer layers (from which nomadic herders get their supply). This will be determined through a combination of groundwater investigations and continual monitoring of wells during implementation. The WBAs will seek to learn from the modeling work carried out by mining companies on the interaction between surface and deep aquifers. In addition, the WBAs will need to interact with the major mining companies to estimate their dewatering needs and determine the impacts of the resulting cones of depression on adjacent and overlying aquifers, users and dependent ecosystems.

The newness of the framework and the obligations and responsibilities under the revised structure will necessitate substantial awareness training, and funding will be used for this purpose. A range of capacity building measures are being considered, including: (a) holding regular "training of trainers" courses; (b) carrying out joint action research projects with local and international universities; (c) working with mining companies that offer regular training programs to their employees to allow participants in the AusAID Program to join their training events; and (d) holding international conferences on water use and mining. There are also opportunities to link this Program with AusAID's broader engagement to develop capacity and human resources in Mongolia through scholarships and short courses.

The AusAID Program will also support the development of a structure that is scalable and that can be replicated. Piloting a new structure in a weak and highly fragmented legal, regulatory and institutional framework for governing water resources in Mongolia calls for a flexible approach, which will be provided in three dimensions: (a) as the new institutional structure is implemented, shortcomings and gaps within the existing legal and institutional frameworks will be revealed and the most pressing needs for specific amendments to laws and regulations, as well as institutional strengthening, will become apparent (with proposals for addressing shortcomings submitted to GOM in due course); (b) Groundwater Management Plans (GWMPs) will initially be designed and implemented with available information, but updated as new information and data become available; and (c) as activities under the AusAID Program are implemented, there will be opportunity to propose an updated timetable or more appropriate activities, which would be agreed by the WA, AusAID and the WB.

3.3. *Expected Outcomes*

Outcomes. Within five years, it is expected that the Government of Mongolia will have improved capacity to proactively monitor and regulate the use and abstraction of groundwater in non-renewable aquifers for different purposes, better protect water supplies of herders and urban citizens, and ensure a socially-sustainable approach to managing water resources in the context of mining and economic development.

To track progress in achieving the objectives and goals of the Program, the outcomes and activities in the following table would be monitored.

Outcome	Activities	Indicators
Organiaational structure for groundwater management established.	• WBC, GWMIU and WBAs fully staffed with functional.	• WBC (June 30, 2012) • GWMIU (August 31, 2012) • WMAs (September 30, 2012)
Officials and stakeholders are equipped to undertake the tasks assigned to them under the 29 River Basin Framework.	• Establish hydrogeological databases, water level recording systems. • Implement capacity building programs. • Purchase information management systems. • Develop water management and monitoring plans.	• Aimag-wide management and monitoring plans prepared and in use (cumulative): - 1 Aimag (December 31, 2014) - 2 Aimags (December 31, 2015) - 3 Aimags (September 30, 2016)
Improved capacity of authorities to make evidence-based decisions about water resource needs and	• Monitoring plans updated quarterly and monitoring activities carried out on regular basis.	• Number of soums in southern Mongolia monitored for GW use under pilot structure (cumulative): - 15 (September 30, 2014)

requirements of industry, communities and mining.		- 30 (September 30, 2015) - 44 (September 30, 2016)
Agreement to implement important recommendations from water resource pricing studies.	• Carry out water resource pricing studies and propose implementable measures.	• Relevant documentation provided to Parliament to enable decision by June 30, 2015.
New institutional structure financially sustainable.	• Alternative source of funding for WBC and WBAs.	• Ten percent of expenses come from sources other than AusAID by January 1, 2015, thirty percent by January 1, 2016, and 100 percent from October 1, 2016 onwards.
Improved transparency and public awareness of groundwater resources and the impact of water use and abstraction.	• Agreements with mining companies and local authorities to share information. • Establish effective I&C System. • Prepare plans for water supply to herders and rural settlements.	• Number of information sharing agreements (cumulative): - 1 (December 31, 2012) - 4 (December 31, 2013) - 8 (December 31, 2014) - 10 (December 31, 2015) • I&C established October 1, 2014. • Number of new monitoring wells established/functional: - 15 (July 1, 2013) - 15 (July 1, 2014) - 15 (July 1, 2015)
The aspirations and findings of the monitoring and management program are effectively communicated to stakeholders, including rural residents, private sector and public service.	• Ensure the WBC and I&C System functioning. • Fund the development of communications plans, and hold regular meetings with concerned stakeholders.	• Number of public outreach meetings: - 3 (September 30, 2014) - 3 (September 30, 2015) - 3 (September 30, 2016)

3.4. *Form(s) of Aid Proposed*

Given the limited level of capacity and constrained financial resources, the support from AusAID would be delivered through technical assistance and capacity building initiatives provided by both internal and external consultants. The assistance would consist of technical reviews and assessments, drilling a limited number of boreholes, taking inventories, carrying out quality surveys, developing management and monitoring plans, and formal training events, both within Mongolia and abroad. For in-country activities, international consultants would co-locate with counterparts at the MNET and the Water Authority. Limited use of World Bank facilities in Ulaanbaatar is also possible.

Training is an important element of the AusAID Program and between five percent and six percent of the overall budget will be dedicated to capacity strengthening measures. This will consist of both in-country and international training events. It is anticipated that staff from the WBAs and the GWMIU would take advantage of water resource in-country training activities prepared by other organizations and firms, such as mining companies operating in Mongolia and local universities. In addition, AusAID's broader engagement to develop capacity and human resources in Mongolia could be linked with this Program through scholarships and short courses. To create an atmosphere of continual learning and maintain a high level of morale, professional staff from the three WBAs and the GWMIU will be encouraged to identify and attend appropriate international training events at least once per year. The technical assistance and learning activities will be jointly managed by the Water Authority, WBAs, and a Task Team Leader at the World Bank.

The procurement and financial accounting of services and goods would be carried out in accordance with World Bank procedures and overseen by the Procurement and Financial Management Specialists at the Project Management Unit (PMU) in charge of the Mining Infrastructure Investment Support Project (located at the Ministry of Finance). Consultants will deliver the work program and report jointly to the Water Authority, World Bank, and the PMU, regarding progress and completion of activities.

During implementation, it is anticipated that AusAID officials will actively participate in formal supervision missions and workshops. Regular monitoring discussions with the Water Authority and Bank Team would be held during implementation.

3.5. *Estimated Program Budget & Timing*

An overall amount of US$7.43 million is being requested from AusAID to help operationalize the new institutional framework. Annex D provides a detailed budget for the Program.

Since the World Bank will administer this assistance on behalf of AusAID, it will need to oversee implementation to ensure that the funds are being spent with efficiency, economy and for the purposes intended. This will necessitate regular interaction with counterparts, participation in events, and the preparation of reports. It might also entail visits to project site(s). The typical budget to supervise World Bank projects, including fees and travel, is around five percent of the overall amount of a project or activity. For the AusAID Program, $75,000 per year, or about 4.5 percent of the overall estimated cost of the Program ($337,500 over four and one-half years), has been assumed and included in the cost of the Program. In addition, the World Bank charges a one-time fee to set-up the trust fund, and administrative fees, which are typically five percent of the overall program amount.

The estimated timeline for disbursing the AusAID funds is the following:

FY	2012	2013	2014	2015	2016	2017
Annual	0.50	1.50	1.50	1.50	1.50	0.93
Cumulative	0.50	2.00	3.50	5.00	6.50	7.43

Note: The fiscal year (FY) is from July 1st to June 30th.

Although not directly related to the proposed program, some initial isotope analyses to better understand the origin and recharge mechanisms of groundwater systems in Southern Mongolia are being carried out under a separate assignment. The results of these analyses will be provided to the WA and WBAs and incorporated into the relevant databases to be established under the AusAID Program.

3.6. *Coordination*

To ensure effective coordination and transparency throughout implementation, there will need to be close coordination with various stakeholders. At the partner level, the GWMIU will serve as the working partner for the AusAID and Bank Teams. The GWMIU will also interact and provide regular updates on progress and emerging issues to senior officials from the MNET, Water Authority, National Water Committee, Ministry of Finance, and other ministries and government agencies, as needed.

The AusAID Program is structured in such a way as to promote stakeholder input at the local and national levels through the WBC, which will be expected to meet on a bi-annual basis, or more as events and issues may require. To regularly coordinate and promote communications, the WBC meetings will alternately be held in Dalanzadgad, Mandalgobi and Sainshand. This will help ensure that issues of groundwater that are specific to stakeholders in those locations receive adequate attention. Funds to cover the costs for key WBC members to travel will be financed under the AusAID Program.

The PMU at the MOF will be responsible for coordinating all fiduciary requirements associated with the AusAID Program, including procurement, financial management activities, accounting, and auditing. All fiduciary requirements will be carried out in accordance with World Bank policies and procedures.

3.7. *Timeframe*

It is anticipated that the AusAID Program will be implemented over a four and one-half year period between April 1, 2012 and September 30, 2016, the closing date of the MINIS.

Based on receiving AusAID's approval for the Program by March 31, 2012, the expected milestones for establishing key groundwater entities include:

- WBC established and Director appointed (June 30, 2012);
- GWMIU established, staffed and functional (August 31, 2012); and
- Three WBAs established, staffed and functional (September 30, 2012).

The PMU at the MOF became fully functional on November 20, 2011.

To be as ready as possible, preparatory activities, including the development of draft terms-of-reference for consultant services, will be carried out by counterparts at the Water Authority prior to AusAID approval of the Program. A procurement plan identifying key specific activities and schedules for implementing those activities has been drafted and agreed with counterparts at the Water Authority (see Annex F).

3.8. *Partners and Stakeholders*

Support from World Bank. In 2008, the World Bank began discussions with Government counterparts about options for strengthening the provision of essential infrastructure in Southern Mongolia in anticipation of the expected increase in population and business investment stemming from the significant mining activity planned for the region. The Southern Mongolia Infrastructure Strategy (SMIS)[1] is a report that assesses options for providing infrastructure to support mining activities in the region and examines the potential environmental and social impacts of large-scale infrastructure development.

The Government of Mongolia subsequently adopted much of the SMIS as a basis to carry out its planning activities for Southern Mongolia, and asked the World Bank to prepare a follow-on project to facilitate development of infrastructure to support mining activities. As one of its components, the Mining Infrastructure Investment Support Project (MINIS) will pilot the government's new institutional structure for managing groundwater resources at three locations in Southern Mongolia. The structure will

[1] This report was partially financed by AusAID.

be made operational under the AusAID Program by establishing one WBC and three WBAs within Aimag boundaries (Dornogovi, Omnigovi and Dundgovi). If successful, it is expected that this structure would be rolled out to other basins. The AusAID funding would finance activities associated with the new structure, which was originally Component 3 of the MINIS.[2]

The World Bank also completed a number of upstream diagnostic assignments to support the development of this Program. A recent consultancy assignment resulted in a plan to support the government's 29 River Basin framework. The report, entitled "A Structure and Framework for Managing Groundwater in Southern Mongolia," recommends policy development, structures and mandates for the River Basin institutions, and a preliminary set of activities for implementation by the WBCs and WBAs. The report is the basis for the AusAID Program.

Support from Other Partners. The Water Authority is currently implementing the Dutch-funded *Strengthening Integrated Water Resource Management in Mongolia* project (IWRM), a Euro 6.5 million (about US$9.0 million), four-year program that began in March 2008 and which supports the Water Authority to:

- Build capacity in the field of integrated water resources management in Mongolia;
- Prepare a National Water Management Plan; and
- Deploy a River Basin Management Plan in a pilot basin.

Under the IWRM, a water basin council has been established for the Tuul River Basin, and it began formal operations in late 2010. A basin management council is expected to be established for the Orhon River, but it has not yet been set-up. A variety of technical studies are on-going on a variety of topics, the results of which will form the basis for the national water management plan. These studies will also support the development of detailed water basin management plans. In designing the AusAID Program, the World Bank Team has worked with and drawn on the work carried out by the Dutch IWRM Team to align activities, ensure complementarity, and leverage our respective support. The Bank Team will continue to interact closely with the Dutch IWRM Team during implementation of the AusAID Program.

The World Wildlife Fund (WWF) has established water basin councils in Khovd, Buyant, and Onon river basins. However, it is important to note that while the water basin councils that are or will be established under the IWRM or by the WWF are the same as those identified in the AusAID Program, the water basin administrations have not been established for these jurisdictions. This has limited the effectiveness of the WBCs created with IWRM and WWF funding.

The assistance outlined in this proposal will serve to build-on and reinforce those activities currently being carried out under the IWRM and by the WWF. However, establishing three basin management administrations is a key difference to past and on-going support and would pilot something that must be implemented for all water basin councils to be effective and sustainable.

International and national mining companies with on-going and planned investments in southern Mongolia have expressed interest and support for the activities to strengthen the government's abilities to manage groundwater in southern Mongolia. In discussions with senior mining officials from Rio Tinto, Ivanhoe, South Gobi Sands, and MCS (Energy Resources), all welcomed the idea of extending support to the Government to develop an appropriate framework for managing this important resource. In addition, all of these mining companies indicated a willingness to pay higher tariffs for extracting and using

[2] Once AusAID has approved this Program, the MINIS will be formally restructured to reflect the AusAID funding for Component 3.

groundwater if the additional monies were dedicated to sustain the new management structure. Rio Tinto executives also indicated that they would welcome the participation of staff from the WBC, WBAs and GWMIU in training programs it organizes for its own water staff.

For a successful outcome, close coordination with other on-going activities will be critical. In designing and implementing the AusAID Program, the World Bank Team will continue to work closely with other donors involved in related projects to ensure complementarity of activities. The Bank Team will also keep the Meteorological and Environmental Monitoring Institute, the Institute of Hydraulics, and the Institute of Geo-Ecology informed of activities, and seek to collaborate on future activities, when appropriate.

3.9. *Government Partners*

The Minister for Nature, Environment and Tourism, the National Water Committee, and the Water Authority have all endorsed the new institutional framework based on 29 River Basins and are actively seeking financing to implement it. Senior officials have expressed genuine concern about how to properly manage water resources, especially groundwater, in the face of such rapid developments in the mining sector. Officials are seeking financial and technical support to strengthen institutional, regulatory and human resourcing arrangements, as well as to assess future water availability and technical options for delivering water to southern Mongolia.

Section 4. Implementation Arrangements

4.1. *Management and Governance Arrangements and Structure*

Management of AusAID Funds. The World Bank will serve as administrator of the AusAID funds and be responsible for overall management of the AusAID Program. The World Bank will ensure that AusAID is given opportunity to participate during implementation and that all of AusAID's reporting and monitoring and evaluation requirements are met.

AusAID funding would be used to co-finance Component 3 of the MINIS. While not expected, funds from the MINIS could be used to finance some of the activities associated with Component 3, should the government choose to do so.

It was agreed that an Umbrella Trust Fund arrangement between the World Bank and AusAID should be set-up to facilitate any future AusAID contributions for Mongolia to be managed by the World Bank. This provides a flexible framework for future contributions and will reduce transaction costs for all partners. The support for groundwater will be the first activity in Mongolia under the AusAID-World Bank framework.

For the AusAID Program on groundwater, an Administrative Agreement (AA) between AusAID and the World Bank would be prepared by the World Bank's Country Lawyer and circulated to Australian officials for comment. Once finalized, the AA would be signed by the relevant parties and the MINIS would be formally restructured to reflect the AusAID funding. Because the AusAID funds would be executed by the MOF (Recipient-executed), there would be a separate Grant Agreement signed by the Ministry of Finance and the World Bank to reflect this arrangement.

Branding. All outputs of the Program will acknowledge AusAID's financial contribution. In addition, appropriate logos from AusAID, counterpart institutions, and the World Bank will be used on documents that are printed and/or published.

4.2. *Implementation Plan*

Implementation Period. It is anticipated that the AusAID Program will be implemented over a four and one-half year period between April 1, 2012 and September 30, 2016, the expected closing date of the MINIS.

Roles and Responsibilities. A core team of World Bank specialists has been assigned to oversee and supervise the Program during implementation, ensure that funds are used for their intended purpose and within the allocated budget, and provide regular updates on progress. The core team consists of a Task Team Leader, a Procurement Specialist, and a Financial Management Specialist. In addition, the World Bank's Trust Funds Department in Washington, DC will monitor Program activities, while the Loan and Disbursements Team in Manila, Philippines will ensure that all required documentation is available before releasing AusAID funds.

The Ministry of Finance (MOF) is the implementing agency for both the MINIS and the AusAID Program. A Project Management Unit (PMU) has been established at the MOF. The MOF will manage the MINIS and the AusAID Program on behalf of project beneficiaries from other ministries and agencies. The PMU will be responsible for: (i) procurement of all services, goods and equipment; (ii) financial record keeping, reporting and disbursements; (iii) project monitoring and reporting; and (iv) managing contractual obligations.

The WA, which is an agency of the MNET, will have responsibility for implementing the AusAID Program. The National Water Committee would also likely play a prominent role. Other Ministries would not be affected by the project's work, but they are expected to become partners, supporters and users of the new framework. Stakeholders are expected to include the Aimag and Soum level governments, NGOs, community representatives, and mining companies.

It is expected that AusAID officials will participate in implementation when possible, including in formal missions to supervise the Program, commenting on outputs produced by consultants and specialists, participating in any workshops that might be organised and meeting with the World Bank regularly to discuss implementation progress.

Annex C provides additional detail on implementation arrangements.

4.3. *Monitoring and Evaluation Plan*

For effective oversight and management of the AusAID Program, a GWMIU will be established at the Water Authority. The GWMIU will be headed by a full-time national consultant, who will work with the Water Authority, World Bank, PMU, AusAID and other implementing partners. The national consultant, or National Water Coordinator, will report to the Water Authority and World Bank Team jointly. The Procurement and Financial Management Specialists at the PMU will be responsible for procuring all services, goods and equipment on behalf of the GWMIU, and ensuring compliance with World Bank requirements.

A Project Implementation Manual (PIM) was prepared to guide implementation of the MINIS and define the framework for managing coordination among the various beneficiaries. Among other topics, the PIM provides job descriptions, details arrangements for implementing the MINIS, and defines training programs on Bank fiduciary and safeguard requirements. It also provides templates for reporting and gives guidance on monitoring and evaluation activities. The GWMIU and WBAs will receive copies of the PIM and should follow its recommendations and guidance to implement the AusAID Program.

Throughout implementation, the World Bank Team will work closely with, and provide on-going support to, the GWMIU, its government counterparts and implementing partners. At least one formal mission will be carried out annually to supervise activities and report on progress against agreed annual work plans to attain the AusAID Program's objectives and outcomes. In consultation with the PMU Director, the National Water Coordinator will prepare written inputs for the quarterly and annual progress reports that will be issued by the PMU as part of MINIS reporting requirements. Quarterly reports will be due the last day of April, July, October and January, while the annual report will be delivered by the end of February. A mid-term review will be prepared before the end of 2013, and an Implementation Completion Report will be completed within six months of project closing. The National Water Coordinator will also monitor progress against agreed performance indicators, as identified in Annex 3 of the Project Appraisal Document for the MINIS, and specifically defined in the Monitoring and Evaluation Framework (Annex E of this document).

For specific studies, assignments and training events financed under the AusAID Program, staff of the GWMIU and Water Authority will work closely with, and provide regular updates to, the PMU on progress in implementing, monitoring and evaluating AusAID Program activities.

Based on the Bank's review of quarterly reports and the results of supervision missions, the National Water Coordinator and Water Authority will take measures to ensure that AusAID Program components are implemented in a manner that allows the development objectives to be achieved.

To track progress in achieving the objectives and goals of the AusAID Program, a table of expected outcomes and activities to be monitored has been included Section 3.3 (*Expected Outcomes*).

4.4. *Fiduciary Arrangements*

The fiduciary arrangements, including all procurement and financial management activities, for the AusAID Program will follow World Bank policies and procedures. The PMU at the Ministry of Finance will be responsible for the day-to-day implementation and management of the MINIS, and for ensuring that the fiduciary aspects of the MINIS and the AusAID Program are carried out in accordance with World Bank requirements. The PMU has hired a Procurement Officer (PO) and a Finance Officer (FO).

Procurement Arrangements. Procurement for the AusAID Program will be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits," dated May 2004 and revised October 2006 & May 1, 2010; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers," dated May 2004 and revised October 2006 and May 1, 2010, and the provisions stipulated in the Legal Agreements.

For each contract to be financed under the AusAID Program, the different procurement methods or consultant selection methods, the need for pre-qualification, estimated costs, prior review requirements, and time frame are agreed in the Procurement Plan. The Procurement Plan will be updated at least annually, or as required to reflect actual Program implementation needs and improvements in institutional capacity. More detail on the various items under different expenditure categories, as well as the Procurement Plan, is included in Annex F.

Financial Management Arrangements. The PMU's FO will be responsible for budget preparation and execution, financial management, including operation and oversight of the AusAID Program's Designated Account (DA) and Operating Account (OA), disbursement, accounting and financial reporting requirements.

The PMU will open and manage separate USD DAs for the MINIS and AusAID funds at a commercial bank acceptable to the World Bank. Funds from the AusAID DA will only be disbursed against eligible expenditures under Component 3 of the MINIS with appropriate approvals from the PMU Director and the authorized representatives from MOF.

Further advances will be made from the AusAID DA to an OA for AusAID to be opened at the same commercial bank where the Program's DAs are located. The AusAID OA will be used to finance small expenditures relating to incremental operating costs of the GMC and GMAs under the Water Authority. The OA will be maintained in Mongolian Tugrug by the PMU. More detail on the financial management arrangements is included in Annex G.

4.5. *Safeguards*

World Bank Safeguard Policies and ESMF. The World Bank's Safeguard Policies and the Environmental and Social Management Framework (ESMF) that was developed specifically for the MINIS will apply to the AusAID Program.

An ESMF was developed because specific projects to be prepared using MINIS funds will only be identified during implementation of the project. The purpose of the ESMF is to ensure that studies carried out under the MINIS to prepare projects, which may subsequently be implemented under separate financing, address and identify measures to avoid and minimise environmental and social impacts, as much as possible, and where they cannot be avoided, the impacts are adequately identified/assessed and necessary mitigation measures designed and implemented following relevant Mongolian environmental and social legislation and the World Bank's safeguards policies.

The future implementation of projects that are prepared with MINIS funding will be subject to the processes defined in this ESMF, regardless of funding source. The ESMF defines how safeguards will be taken into account and managed for all project activities that may have safeguards requirements, including feasibility studies. During implementation of the MINIS, project activities with potential safeguard issues will be screened to determine the scope and types of safeguards instruments that would be required.

To ensure that any future transactions with investors include relevant measures to safeguard the environment and minimise the potential for negative social consequences, the ESMF would be part of contractual documents for implementing transactions for which MINIS funds were used to help prepare.

The ESMF identifies the responsibilities of project stakeholders, procedures for environmental and social safeguards screening, review and approval, monitoring and reporting requirements, as well as plans to enhance institutional capacity. The ESMF serves as an environmental and social safeguards instrument to provide the framework to both the relevant government agencies and private investors for preparing and implementing infrastructure projects.

World Bank Input on Management Plans. Once the WBAs have gathered enough information and data to prepare groundwater management plans, the views and input of World Bank safeguards specialists should be obtained to ensure that the plans are developed in a manner that is socially and environmentally sustainable.

4.6. *Sustainability Issues*

Sustainability involves two issues: (a) the groundwater resource itself; and (ii) institutional arrangements of the pilot structure. As discussed in Sections 2 and 3, groundwater resources in the SGR are non-renewable and when exploited, sustainability is unlikely. This Program will give grounds for

government and stakeholders to devise a best approach considering inter-generational equity when preparing the groundwater management plans for the pilot aquifers at the Aimag and SGR levels.

The issue of institutional sustainability will be addressed in this Program by reinforcing the abilities of the WA by establishing a small Groundwater Management and Information Unit. It is expected that the GOM will commit to formalise the pilot structure, including the WBC and three WBAs, by December 2015. Mainstreaming the pilot structure will encourage government and stakeholder ownership of the new institutional structure. To reinforce the need for sustainable financing, GOM will be expected to pay ten percent of the new institutional arrangements expenses by 2015, thirty percent during 2016, and 100 percent after the AusAID Program closes. To encourage the GOM to identify a sustainable source of financing, the Program puts emphasis on early implementation of a study to examine possible sources of funding. An aggressive capacity building program is another component of the AusAID Program that will contribute to sustainability of the resource and pilot institutional structure.

4.7. *Overarching Policy Issues of Gender, Anticorruption, Environment and Child Protection*

Principal background references (Tuinhof A & Buyanhishing 2010 and World Bank 2011c) and the November 2011 preparatory mission to Ulaanbaatar address gender issues. However, the following arguments/recommendations (AusAID 2011c, UNESCO 2011, and Moulik 2011), warrant an early stocktaking activity to be included in the preparation of the GWMPs at the aquifer pilot and Aimag levels:

- The World Bank has demonstrated that activities that take gender equality into account tend to achieve their objectives more often than projects that do not.
- The AusAID Program will provide an indispensable opportunity for consultations with men and women on a socially-sustainable approach to managing non-renewable groundwater resources.
- UNESCO's recent International Conference Millenia 2015 produced an action plan for empowering women in line with the Millennium Development Goals, to which the GOM is a partner.

The following activities are anticipated in the groundwater planning process:

- identifying the roles of men and women in the target beneficiary communities (particularly rural and nomad herders), and the benefits that they may derive;
- assessing existing tenure arrangement, including how proposed project interventions might impact women's and men's rights to, and use of, groundwater resource;
- ensuring equal representation of women, particularly vulnerable groups, in the capacity building and training programs; and
- if possible, including gender disaggregated monitoring indicators to track the benefits and results of the AusAID Program.

Socio-economic development specialists are expected to be part of the GWMIU and WBA teams. To support gender equality, potential gender-specific impacts will be considered in the development of management and monitoring plans. In addition, preference to qualified female applicants for these positions should be encouraged.

Experience in developing countries and nations in transition indicate that corruption and vested interests are perhaps the single most important impediment to effective groundwater rights administration. Establishing information and communication systems (Activity 3) has been recommended because transparency in information is a proven preventive measure against corruptive practices.

As for the environment, Activity 9 ("Conduct Groundwater and Water Investigations") includes priority studies of water requirements to maintain nature and environmental functions in the selected Aimag priority areas.

This activity would not involve work with children.

4.8. *Use of Imprest Accounts*

The use of all AusAID funds will be subject to World Bank guidelines, processes and procedures. There is a well defined process with sufficient safeguards and checks to ensure sound fiduciary management. As described in Section 4.4, a DA and OA will be set-up at a commercial bank acceptable to the World Bank for funds under the AusAID Program. Setting up local petty cash accounts for the WBC and three WBAs is planned. This will be done through bank transfers to cover small operating expenses, such as fuel, stationary, office supplies, etc. The petty cash ceiling shall not exceed an equivalent of USD$500. Petty cash balances will be reconciled on a monthly basis. The WBC/WBAs will be responsible for providing copies of the petty cash expenditures to the PMU for accounting, reporting and replenishment purposes. For more detail on the financial management arrangements, please see Annex G.

4.9. *Compliance with the Environment Protection and Biodiversity Conservation Act*

There are no activities that would suggest a check on environmental issues is required to ensure compliance with AusAID's legal obligations, for example, under the Environment Protection and Biodiversity Conservation Act.

4.10. *Critical Risks and Risk Management Strategies*

Some of the more critical risks and measures to mitigate those risks are identified below:

Description of Risk	Risk Rating	Mitigation Measures
Political Risks		
Proposed amendments to Water Law to strengthen WA's management of water resources, including groundwater, not approved.	Moderate	Ensure MPs are aware of basis for amendments and the benefits they will bring in water resource management.
Slow pace of reforms.	Moderate	GWMIU and WBC to regularly meet with senior government officials and make certain they have all required information to take decisions.
National and Aimag level objectives for water use differ.	Moderate	Ensure WBC has balanced representation, meets regularly and conveys results of meetings to all stakeholders.
Technical Risks		
Lack of willingness among some Government	Moderate	Explain concept and importance of

agencies and mining companies to share existing data on water resources.		cooperation through individual meetings and learning events.
Drilling of boreholes and installation of monitoring equipment poorly done.	Low	Develop good TORs and only hire qualified consultants. WBA staff to oversee first three installations.
Private Sector Risks		
Preference for use of groundwater given to mining interests.	Moderate	Ensure MNET, WA and WBC members understand importance of balanced approach to groundwater use. Establish AMOREs and solicit involvement in WBC meetings. Focus initial assessments and studies on the water points used most by herders and communities.
Social Risks		
Access of local communities and herders is reduced or eliminated.	Moderate	As a priority, identify alternative sources of groundwater for herders and communities that could be impacted most.
Conflict between different ground water users.	Moderate	Use participatory methods throughout the project, and allow for different user needs and perspectives to be incorporated into plans.
Economic/Fiscal Risks		
After Program closes, no budgetary support provided to continue work of WBC and WBAs.	Moderate	As a priority, carry out study to identify a sustainable revenue stream that does not rely 100% on government support.
Staffing Risks		
Qualified staff for the GWMIC and WBA not available.	Moderate	Provide on-going support to develop skills and abilities.
Unwillingness of Mongolian staff/experts to relocate to remote areas.	Low	Provide appropriate salary and incentives, including training.
Implementation Risks		
Implementation starts slowly.	Moderate	Early preparation of implementation plan and TORs for key positions. WA to work closely with PMU throughout tender processes.
Project champions may change, interests of line ministries not aligned.	Moderate	MOF serves as project champion and neutral body with power to convene and arbitrate among sectoral ministries. Project Team to work closely with concerned counterparts during implementation and looks to identify new champions, as warranted Procurement training to be provided by Bank UB Office before start up of project launch.

Corruption Risks		
Vested interests undermine effective management of groundwater.	Moderate	Establish effective I&C systems and make information on groundwater publicly available.

Annex A: Country and Sector Issues

Country Issues

Mongolia's mining sector is a major contributor to the economy. It accounts for about one-third of the country's economic activity, some 85 percent of exports, and generates nearly 40 percent of government revenue. Foreign direct investment (FDI) in the sector currently accounts for nearly 80 percent of total FDI, and this is expected to climb in the coming years. It is widely recognised that the country's wealth of mineral resources offers perhaps its greatest potential for economic growth and development.

The Government of Mongolia (GOM) is placing a high priority on bringing new strategic mineral deposits into production, as quickly as possible. In October 2009, an Investment Agreement was signed with Ivanhoe Mines to develop the Oyu Tolgoi copper and gold mine, and the Government is seeking to move forward rapidly with investment agreements to develop the Tavan Tolgoi (TT) coal mine. In March 2011, six groups were shortlisted to develop part of the massive TT coal field. Although an agreement has not been concluded, one is expected by Spring 2012. Additional agreements at other possible mine sites are under varying stages of development.

Most of the areas with large mineral reserves are remote, lack appropriate access infrastructure, and are without dependable utility services, including power, water and heat. For mines to become fully operational, an array of infrastructure facilities and services will be required. Both mining operations and large-scale infrastructure require significant amounts of water during construction and operation.

While attention has long centred on devising appropriate legal and regulatory frameworks to govern the extraction of mineral resources and in concluding investment agreements with mining firms, far less focus has been given on the availability of water to support the development of mines, and how to ensure its equitable and sustainable use for all stakeholders. The Ministry of Nature, Environment and Tourism (MNET) recognises that better water management is essential to the Government's long-term plans to develop the mining sector. As such, MNET has prepared a national strategy and structure for introducing an integrated approach to managing the country's water resources. The development of effective water management plans and pricing structures will depend on sustained data collection and analyses. However, MNET lacks the financial resources needed to effectively carry this out.

To assess the feasibility of proposed legal amendments to be considered by Parliament to ensure that the management of groundwater contributes to social equity, and to prepare implementable Groundwater Management Plans, the following national backdrop (Garduño 2010, and the findings of November 2011 mission to Ulaanbaatar) is useful. The Program should ensure that, where needed, a breakdown at Aimag and even pilot aquifer level is prepared:

- The Mongolian People's Revolutionary Party (MPRP) gained a solid majority in the 2008 Parliamentary elections (64% of seats), but formed a coalition government with the Democratic Party. The prime minister and most Cabinet members are MPRP members.
- The fact that national elections for State Great Hural (Parliament) will be held in June 2012 makes it important to have a fully staffed and operational GWMIU by June 30 2012. On the other hand, the WA is confident that before that time the amendments to the Water Law of 2004 they have proposed (which would make implementation of the new institutional structure for groundwater management easier) will be approved, because 2011 has been called the Year of Water and Environment, and three out of ten issues in each Soum relate to water. Nevertheless,

as described in the introduction to Section 3, the AusAID Program proposes a cautious approach in the event said amendments are not approved.

- The current President, Mr. Tsakhia Elbegdorj, has been in power since June 18, 2009. He was elected with 51 percent of the popular vote. The next Presidential elections are scheduled for May 2013. This increases the probability that the amendments mentioned above that are proposed for legislative approval would have good chances of being approved, if the next President (whose term would finish after completion of the AusAID Program) has similar support from Parliament.
- Democratic maturity is indispensable for achieving meaningful stakeholder participation processes. The Economist Intelligence Unit Index of Democracy[3] (focuses on five general categories, which include: (i) electoral process and pluralism; (ii) civil liberties; (iii) functioning of government; (iv) political participation; and (v) political culture. According to this source, Sweden has achieved full democracy and ranks first in the world with a grade of 9.80. On the other end of the scale is North Korea, which has an authoritarian regime and ranks 167th with a grade of 0.86. Mongolia has a ranking of 58 with a grade of 6.60. As such, it's important that the Program stresses the need for capacity building and participatory processes in groundwater management. At the same time, the high literacy rate (almost 98 percent) is an asset to promote stakeholder participation.
- Biased or corrupt behavior in government hinders rational groundwater allocation and regulation. It can also impede community-based groundwater management programs. According to The Economist Corruption Perception Index,[4] the less corrupt countries in the world are Denmark, New Zealand and Singapore with a rank of one and a grade of 9.3, while the most corrupt country is Somalia with a rank of 178 and a grade of 1.2. Mongolia ranks 116 and has received a grade of 2.7. Corruption is an issue that must be taken into consideration.
- In Mongolia, 36 percent of the population lives below the poverty line, but when compared with other developing nations, its income distribution is fair. Nevertheless, inequality is an issue in Mongolia, since, as shown in the next table, its human development index losses amount to almost 14 percent when inequality is added to the equation. Therefore, the GWMPs that will be prepared should take stock of inequality in each Aimag and anticipate how groundwater supply could improve the situation of the poor.

Country	**Human Development Index (HDI)**						
	Value					**Overall Loss (%)**	
	1980	**1990**	**2000**	**2010**	**2011**	**2011***	
Norway	.796	.844	.913	.941	.943	0.890	5.6
Mongolia	--	.540	.555	.647	.653	0.563	13.8
Chad	--	--	.286	.326	.328	0.196	41.6

* Inequality adjusted index. Source: Klugman J 2011.

[3] http://en.wikipedia.org/wiki/Democracy_Index.
[4] http://www.transparency.org/policy_research/surveys_indices/cpi/2010/results).

Sector Issues

Many Institutions are Involved in the Water Sector, but Comprehensive Policy Missing. The water sector in Mongolia is institutionally multifaceted and dispersed, especially at the national level, with thirteen main agencies and many minor ones involved in various aspects of sector planning and management. There are often overlaps, and sometimes gaps, in responsibilities. There is no single body responsible for coordinating surface and groundwater management in Mongolia, although several Ministries and institutes carry out part of the tasks, and no coordination of water management at the Aimag and Soum levels.

Water issues come under the jurisdiction of the Ministry of Nature, and Environment and Tourism (MNET). The Water Authority (WA), which is under MNET, is the main implementing agency of the Water Law (2004). At the central level is the National Water Committee (NWC), but its responsibilities and functions are not clear due to lack of legislation. The Ministries of Roads, Transport, Construction and Urban Development, Food, Agriculture and Light Industry, Mineral Resources and Energy, and Health are also involved in aspects of water and its delivery. Although the organisational responsibilities at the national level are formally established, a comprehensive policy on water issues is lacking.

Insufficient Planning. Neither the mechanisms to manage large-scale surface and groundwater use, nor the capacity to monitor and enforce laws are currently in place. However, appropriate plans to monitor and manage the use of water resources are essential to ensuring that long-term development of mining and other economic activities can occur without endangering supplies to local communities and herders. There has been some improvement with the recent approval of the "National Water Program" (GOM 2010a and GOM 2010b), which is a useful backdrop for preparing groundwater management plans under Activity 6. In addition, the following should be taken into account when developing the management plans:

- Reinforce the fact that development of the mining sector in Southern Mongolia will depend on non-renewable groundwater resources;
- Water resources planning and land use planning must be linked to ensure quality measures are in place to adequately protect groundwater; and
- The link between groundwater and urban development should be made by acknowledging that pragmatic approaches, such as making use of soil and underlying strata treatment capacity and simple wastewater treatment technologies, could be preferable to more sophisticated and expensive technologies adopted from developed nations (Jiménez C 2010, Cisneros BJ 2011, and Crook, et al 2005).

Uneconomic Pricing of Water Resources. The current pricing regime for water resources does not appear to be based on economic principles. A review of Mongolia's water resource pricing principles should be used to set tariffs at levels which encourage appropriate levels of use and recycling, especially for mining activities. In addition, the applicability of creating markets for buying and selling water rights should also be examined, along with creating a reliable water use rights administration and measures to protect vulnerable sectors.

Lack of Capacity and Financial Resources. A key constraint to better management is the lack of capacity and financial resources. For example, the local Department of the Environment and Tourism in the Aimag capital of Dalanzadgad (located in Southern Mongolia) is responsible for implementing and enforcing laws and regulations pertaining to the environment, including groundwater issues, tourism and wildlife. To do so, they have four staff, an annual budget of about US$70,000, and an area to patrol that

covers some 350,000 square kilometres. This is typical of local Departments of the Environment and Tourism countrywide and clearly has a detrimental impact on the ability to enforce laws and regulations governing the sector.

Framework for Water Resource Management. In 2004, the Government of Mongolia adopted the water basin approach for managing its surface and groundwater resources, which is an essential first step to introducing an integrated approach to managing water resources throughout the country. The establishment of Water Basin Councils (WBCs) is specified in the Water Law (2004), which further specifies powers of the WBCs. These include assessing water resources, planning for the use of water resources, monitoring and protecting water resources, and conducting appropriate research.

The Water Authority has now identified 29 water basins that cover the entire country. Most of the river basins correspond to, and are aligned with, the natural geographical features of main bodies of surface water. However, for the southern part of Mongolia, these basins are in fact "groundwater basins," as surface water drainage is of minor importance there. For these basins, the WA has agreed to align their boundaries with Aimag boundaries, rather than topographical boundaries as for the surface water basins.

The Government is in the process of establishing its new institutional framework to manage water resources throughout Mongolia. The proposed basin level water management organisations would consist of Water Basin Councils (WBC), and Water Basin Administrations (WBAs). Together, these organisations would form the principal organizations for Integrated Water Resources Management (IWRM) in a basin. This proposed structure reflects the institutional organisation at the national level with the NWC, which ideally would be responsible for setting policy at the national level, and the WA, which would provide information and data to the NWC and implement national policy.

The WBCs would act as the basin level coordinating bodies, in which all relevant stakeholders and actors would be represented to voice and protect their interest in groundwater management in their respective basins. The smaller WBAs would have full-time staff to carry out the daily management tasks. They would function as the knowledge and information centre on water issues in the basin and carry out or commission and supervise the supporting studies for policy development and IWRM. The two entities are considered to be equally important, since the WBCs will ensure stakeholder participation and the WBAs will carry out the detailed daily activities, and gather, store and maintain the information on groundwater, and in some cases, surface water.

The proposed institutional structure to strengthen water resource management represents a progression to the practical natural resource management required to accompany mining development throughout Mongolia and help to preserve resources for the traditional pastoral herding community. The Program is an institutional strengthening exercise to fast track the capacity of the Water Authority to address emerging issues regarding competition for water. In devising an appropriate framework to strengthen the management of its water resources, Mongolia is looking to learn from other mining countries with similar challenges, such as Australia, Botswana and Chile.

Way Forward. A balanced approach to implementing this Program must be taken considering: (a) that the WA puts high hope in Parliament approving certain amendments, which were prepared with assistance from the Dutch IWRM Project; and (b) international experience, which teaches that reforms must be taken within often imperfect legal and institutional frameworks usually found in developing nations. Therefore, the measures to be taken in order to strengthen groundwater management at the central and Aimag levels will be designed within the existing legal framework, considering that the groundwater management pilots will provide an opportunity to test the real need of legal amendments being considered and, by the end of the Program's fourth year, sound recommendations may be given.

Annex B: Detailed Description of Program Activities

Program Overview

The AusAID Program will strengthen the capacity of local authorities to manage groundwater resources in Southern Mongolia. A new institutional structure will be piloted at three Aimags in the region (Dornogovi, Omnigovi and Dundgovi), which have fairly small and horizontally independent aquifers that can be managed independently. The management of these non-renewable resources will be piloted in priority areas in each Aimag with a socially-sustainable and participatory approach. A framework, including a mandate and staffing needs, has been defined and will be made operational under this component. Under the pilot structure, one groundwater management and information unit, one Water Basin Council (WBC), and three Water Basin Administrations (WBAs) will be established and made operational.

Pilot Structure

GWMIU Establishment. It is expected that the GWMIU will be established by June 30, 2012. The senior hydrogeologist and other members of the GWMIU, which will be financed under the AusAID Program, will support the process to identify and procure consultant services and start the process of gathering data and incorporating it into the database system. The staff of the GWMIU will be financed under the AusAID Program and will consist of: (i) a National Coordinator/Senior Hydrogeologist; (ii) GIS Database Specialist; and (iii) Socio-Economic Development Specialist. It is expected that the WA will provide the administrative and secretarial support for the GWMIU.

Office and technical equipment for the GWMIU will be financed by the AusAID Program and will consist of:

- furniture;
- hardware, including computers, printers (color and black and white), internet connection;
- software (Office with Word, Excel and Power Point, GIS, dedicated open source database); and
- a library of selected handbooks.

GWMIU Operation. The objective of the GWMIU is to support the WA with the following activities:

- Playing the role of focus operational counterpart to consultants;
- Providing technical and socioeconomic guidance of the three WBAs;
- Consolidating the databases of the three WBAs into the WA's existing database
- Consolidating the GWMP for the SGR;
- Preparing a general framework for managing non-renewable groundwater resources in the SGR; and
- Operating the I&C System.

WBC Establishment. One WBC will be established to serve as the focal point for key stakeholders in the three Aimags that will have WBAs. It is anticipated that meetings of stakeholders will be held on a bi-annual basis, or more frequently as circumstances warrant, and that the meetings will be held in each of the three Aimag capitals on a rotational basis. The WBC Chairman will ensure that key

results and discussion topics from the meetings will be provided to relevant authorities, including the MNET, WA, NWC and WBAs. Since the Chairman and Secretary are likely to be civil servants, their salaries will not be funded under the AusAID Program. However, an Administrative Secretary and the travel-related expenses of the Chairman and Secretary will be funded from the Program.

Office and meeting room facilities will be provided by the Aimag organization hosting the rotational meetings and not financed by under the AusAID Program. However, the costs for the Chairman, Secretary and members to travel to the Aimag capitals to attend the rotational meetings will be financed through the Program.

WBC Operation. Establishing one WBC for the three selected Aimags has the advantage of sharing experiences and developing a common socially-sustainable approach to mining non-renewable aquifers for the SGR. However, having only one WBC has the disadvantage of being removed from specific issues at the local level in selected pilot aquifers. To help ensure stakeholder participation at the Aimag level, consideration will be given to establishing ad-hoc Aquifer Management Organizations (AMORs), as discussed in Activity 6.

Composition of the WBC will be based on the Article 19 of the Water Law of 2004 for the River Basin Councils, as follows:

- A Chairman;
- A Secretary; and
- Up to 15 members representing key stakeholders in the three Aimags, including:
    - local administration;
    - environment departments and environmental rangers;
    - agriculture;
    - industry;
    - non-government organizations;
    - citizens and herders;
    - scientists and researchers;
    - the professional inspection agency; and
    - professional organizations on water issues.

The Chairman and Secretary of the WBC will be elected by the members. The specifics of the election procedure and meetings will follow the draft Regulations for RBC, but the international and national legal consultants will analyze the possible consequences and way around within the fold of the law because said regulations have not been issued officially yet.

In line with the Water Law of 2004, Article 19 for Water Basin Councils, the WBC should be appointed by Presidiums of an Aimag, have a four-year mandate and, depending on performance of its duties, be reappointed.

The council will act as the coordinating body through which all relevant stakeholders and actors of the SGR will be represented to voice and protect their interest in groundwater use and management. The Chairman of the council will be elected from among its members and will need to be approved by MNET, as specified in the Water Law of 2004. The Chairman should participate in yearly meetings

organized at national level by the NWC and/or the WA. This would allow for the SGR concerns to be expressed at the national level, which could then be reflected in policy making.

Given the key role of the WBC in overseeing the process for strengthening groundwater management in the SGR, it should be established from the outset. It is envisaged that the WBC will hold "rotational meetings" in the three capital cities that have WBAs. The role of the WBC in coordinating dialogue among numerous stakeholders will be challenging, relevant and have an impact on groundwater policy at the national level that may drive groundwater abstraction and pollution rationalization.

Task and Responsibilities of the WBC

MAIN ACTIVITY	DETAILS	COMMENTS
Groundwater Coordination (Horizontal)		
Organize groundwater coordination meetings	Discuss groundwater related issues/problems with participation of relevant stakeholders.	Frequency as needed
Organize groundwater coordination meetings	Discuss and evaluate draft GWMPs as consolidated by GWMIU based on individual Aimag-GWMP prepared by WBA.	After approval
Management of WBA	Evaluate WBA reports and give direction to WBA.	
Groundwater Coordination (Vertical)		
Coordinate with national level water-related government organizations	Chairman to attend national coordination meetings to represent the three Aimags.	Voice problems, issues, & concerns to influence national policy.
Coordination with aimag and soums	Discuss groundwater related issues/problems with participation of respective aimags and soums.	

Establishment of WBAs. WBAs will be established in each of the three Aimag capitals of:

- Sainshand, capital of Dornogovi (East Gobi);
- Dalandzadgad, capital of Omnigovi (South Gobi); and
- Mandalgovi, capital of Dundgovi (Middle Gobi).

WBA staff, which will be financed by AusAID, for each of the three WBAs will include:

- Director/Senior Hydrogeologist;
- Water Quality Engineer;
- Water Engineer;
- GIS Database Specialist;
- Socio-Economic Development Specialist; and
- Driver.

It is expected that Aimag officials will provide secretarial services for each WBA.

The following office and technical equipment will be provided to each WBA:
Office Equipment:

- Furniture;
- Hardware, including computers, color and black and white printers, internet connections, etc.;
- software (Office with Word, Excel and Power Point, GIS, Groundwater Modeling, Aquachem for visualizing water quality data), dedicated open source database;
- library (selected handbooks); and
- laboratory for water quality analyses.

Field Equipment:

- one field vehicle;
- GPS equipment;
  water quality sampling equipment;
- conductivity meters; and
- water level monitoring with data-loggers for up to ten wells.

Operation of WBAs. Under the guidance of the GWMIU, the Aimag-based WBAs will carry out the daily groundwater management tasks in their respective Aimags and will work directly with the consultants carrying out various activities. The Directors of the WBAs will be hired by the WA.

The tasks and responsibilities of the WBAs will include: (i) data management; (ii) planning; (iii) groundwater research; and (iv) other activities. A question that will be addressed under the Program is the relationship, if any, between deep and shallow aquifers, and what influence the abstraction of groundwater from deeper aquifers might have on shallow aquifer layers (from which nomadic herders get their supply). This will be determined through a combination of groundwater investigations and continual monitoring of wells during implementation.

Although the legal basis for the WBAs is still emerging, there does not appear to be a problem in undertaking their technical functions as defined in this document. Current arrangements for carrying out enforcement activities, which are currently under the Environmental Department in the Aimag Governors' offices, will continue, albeit with technical support from the WBAs. However, given the limited institutional capacity of the Aimag offices, which is not unusual in many developing countries, the following "threshold and trust the user" pragmatic approach (to be assessed by the legal consultants to ensure that the specifics would fall within the fold of the law) could be implemented:

- Definition of "thresholds" for existing water use norms and wastewater discharge standards. For water use and discharge below specified volumes/year for different types of water use and regions, define reasonable values to be applied generally.
- For other cases, define conservative and stringent values, but provide for users/polluters to contest them if in disagreement and provide evidence through studies to be undertaken at the user or polluter's expense and assessed by independent university researchers/consultants.
- For monitoring, compliance and enforcement, a general "trust the user" approach with the only obligation to report abstraction volumes and wastewater discharge volumes/quality over specified periods of time. Based on a three dimensional matrix of type of water use, range of volume and regions, randomly select a number of representative users/polluters to be audited annually (to be consistent with available institutional capacity). Proceed immediately to

apply the full weight of the law to users/polluters found not to be in compliance with laws and reporting requirements, and widely publicize these cases in the media. Independent arbitrage should be available in case of disagreement. The three dimensional approach recommended above - random selection, transparency and independent assessment - could deter violators and discourage corruption.

Task and Responsibilities of the WBAs

ACTIVITY	DETAILS	COMMENTS
Groundwater Resources Data Management		
Gather existing data	Data collection with other institutes, data owners, etc. Develop database and utilize.	Database development is one time activity during start-up. Adding new data is continuous activity.
Assess existing groundwater data	Assess status of existing knowledge, identify gaps, evaluate groundwater resources in Aimags.	Include resource and use profile information and users data in water well inventories. Entire Aimag with focus on target areas.
Groundwater assessment studies	To collect new data in selected areas on selected aspects. Monitor quantity and quality.	Focus on target areas within Aimags, outsourcing, monitoring.
Dissemination of data and information	Make data available in reports, data sets, maps, etc., as requested by interested users.	Short-term: GIS based output. Long-term: website-enabled output
Planning Water-Related Activities		
Demand analyses	Make demand projections.	Based on population, agriculture, livestock, environmental and industrial growth projections.
Resource studies	Study need for resource protection / options for enhanced recharge.	Determine whether recharge enhancement is feasible option.
Demand studies	Study options for demand management, efficiency improvement/water reuse options	Use pricing as management tool.
GWMPs	Develop an Aimag Groundwater Management Plan and a pilot AQ-GWMP	Get support for the GWMPs from WBC, provide regular updates.
Groundwater Exploitation		
Licensing	If permitted under existing laws, evaluate requests for licenses to extract groundwater, evaluate related EIAs, recommend allowable exploitation regimes and monitoring measures, register approved exploitation licenses.	Focus on target areas first.
Water use	If permitted under existing laws, monitor license compliance, actual water use, vulnerability.	Focus on target areas following the “threshold and trust the user” approach.
Law enforcement	If permitted under existing laws, recommend measures in case of non-compliance.	Focus on target areas following the “threshold and trust the user” approach.
Other Activities		
Carry out specific studies	Groundwater studies for specific development areas / specific problems, such as groundwater quality (Arsenic, fluoride).	Commission “research action” projects with Mongolian university.

Guidelines	Develop guidelines for well construction, operation & maintenance, hand-pump installation.	Commission project with Mongolian University.
Reporting	Report to WBC/WA on activities and planning	Ensure feedback from both taken into account.
Budgeting and financial reporting	Prepare yearly budgets for approval and allocation of financial resources / provide financial statements and audit reports.	To be approved by WBC and WA.

Staff Descriptions and Qualifications

The following table outlines staff descriptions and qualifications for the institutional structure to be piloted under the AusAID Program.

POSITION	EXPERTISE	COMMENTS
GWMIU Staff		
Director/Sr. Hydrogeologist	Academic background in groundwater	Oversee GWMIU activities
GIS Database Expert	MSc/BSc with 8 years relevant experience	Database, GIS, public information section.
Socio-Economic Development Expert	MSc/BSc with 8 years relevant experience	Sociologist/economist experienced in the Mongolian water sector and/or participatory processes.
WBC Staff		
Chairman	Academic with political ability or high-level politician	Elected by members
Secretary	Academic with political ability or high-level politician	Elected by members
Administrative Secretary	Previous relevant experience	Maintain communications with members and WBAs, and organize meetings.
Fifteen members representing major stakeholders.		
WBA Staff		
Director/Sr. Hydrogeologist	Academic background in groundwater	Head of WBA, hydro-geological studies, water resource planning & management.
Water Quality Engineer	MSc/BSc with 5 years relevant experience	Responsible for water quality activities.
Water Engineer	MSc/BSc with 5 years relevant experience	Supervise drilling, water monitoring, meteorological measurements.
GIS Database Expert	MSc/BSc with 8 years relevant experience	Database, GIS, public information section.

Socio-Economic Development Expert	MSc/BSc with 8 years relevant experience	Sociologist/economist experienced in the Mongolian water sector and/or participatory processes.
Driver	Experience driving in Mongolian countryside.	

Formalization of the New Institutional Structure

It is expected that, in order to contribute to the Program's sustainability, the pilot structure will be formalized by Ministerial Decree or Resolution by December 31, 2015. Consultant services will advice on the preparation of said resolution.

Detailed Program Description

The publication entitled "Framework and Development Plan for a Groundwater Management Center in Southern Gobi, Mongolia" (World Bank, January 2011) provides additional details on activities to be carried out under the AusAID Program and should be read as a companion to this section.

One of the main challenges will be to develop an effective structure that contributes to meeting the "SUR Challenge," or sustainability, upscalability and replicability. This will contribute to a more socially-sustainable approach to managing groundwater in the SGR. The following activities will be carried out under the AusAID Program.

Activity 1: Prepare Terms-of-Reference for AusAID Activities

To support the development of appropriate terms-of-reference (TORs), and as a means to strengthen local abilities, consultants could be hired to support the WA in the preparation of TORs for consultancy assignments to be financed under the Program.

Activity 2: Assess Legal and Institutional Framework

Building on Jaspers 2009a and Japers 2009b, a systematic analysis of groundwater management related legislation and institutions[5] will be prepared to serve as a backdrop to identify possible amendments to existing legislation and institutions to enable a strong framework for managing groundwater resources.

Activity 3: Purchase and Install Management Information Systems

The WBAs will use digital databases to store hydrogeological information and other relevant data, and the three databases will be consolidated by the GWMIU and integrated into the existing WA database. The systems to be purchased and the accessibility to users outside the WA and WBAs must be compatible with existing systems.

The database of the WBAs will address all basic information, and the contents should comprise, at a minimum:

- Data on deep boreholes, shallow wells and springs (locations, properties, ownership, status);
- Groundwater levels;

[5] Garduño & Yuquan presents a similar analysis for the case of China vis à vis international experience that may be useful.

- Groundwater quality data;
- Data on water users and abstractions;
- Water use licenses; and
- Public and private institutional networks related to groundwater abstraction and pollution.

All data should be geo-referenced to allow map preparation and data processing using GIS software.

Activity 4: Establish Information and Communication System[6]

An effective Information and Communication (I&C) System is key to transparency and accountability of groundwater issues, and is a critical pillar of any resource governance framework. I&C system should provide not only fundamental technical information on resource status, trends and vulnerabilities, but also serve as a guide to the complex network of public agencies, groundwater users and other stakeholders involved. The I&C should be stakeholder-friendly and help in building capacity to access, use and generate information, including groups with different capacities, traditional community outlets, the mass media and modern internet-based information channels.

The I&C System will be designed to accommodate the situation and characteristics in Mongolia, be compatible with the networks used by the MNET, WA and NWC, and be geared to facilitate rational groundwater development and participatory management. It should also be reviewed periodically for effectiveness. Since the WA already has a functioning database and a public awareness and communication system, a pilot component of an I&C System could be designed and implemented only for groundwater in the SGR. The detailed proposal of a World Bank consultant (Funes 2009 – in Spanish), which considered such a system for IWRM in the arid north-eastern Brazil, could be a good source of information.

Activity 5: Gather and Manage Information for the Three Aimags

Sources of existing data for the databases include:

- Ministry of Mineral Resources and Energy, Mineral Resource Authority, Geological Information Center;
- Ministry of Agriculture, Food and Light Industry;
- Water Authority;
- Geo-Ecology Institute;
- Mongolia University of Science and Technology;
- NAMEM – IMH;
- Mining companies (Energy Resources, Ivanhoe);
- Consultant companies (Aquaterra, Dunar-Od, Hydromet, etc.); and
- Aimag offices.

Activity 5.1: Information Gathering. The WBAs will identify critical gaps in information in order to have complete data and information related to the following:

- Borehole, well and spring inventory;
- Groundwater use inventory;

[6] GW-MATE SO-1 2010, The Communication Initiative Network 2009).

- Groundwater quality survey;
- Groundwater isotope survey;
- Aquifer tests;
- Hydrogeological mapping; and
- Assessment of groundwater recharge;

To obtain as complete a picture as possible of groundwater conditions, and to establish effective measures to monitor use, up to forty wells may be drilled. The boreholes would be four inches in diameter and generally go to a depth of 100 meters, but in some instances the depth could be more.

Activity 5.2: Hydrogeological Data Management. One of the main tasks of the WBAs will be to collect, store and process basic information on groundwater resources to support the development of the water management plans. Important tools to carry out this task include:

- A hydrogeological database;
- Hydrogeological maps; and
- Water use maps (including vulnerability).

The databases should be developed to serve all organizations that are actively involved in the development, management and protection of groundwater resources in a given Aimag. Data sharing among these organizations would be essential for the success of the IWRM approach. For a description of these tools and related tasks/studies that can be undertaken based on them, such as groundwater quality protection, efficient use of groundwater resources, enhancement of groundwater recharge, and technology development and quality control of well drilling and pumping equipment, see World Bank 2011c.

Activity 6: Identify Sustainable Revenue Sources

Water resource pricing principles should be used to set tariffs at levels which encourage appropriate levels of use and recycling, especially for mining activities. A permanent source of revenue, independent of full budget allocations, to finance the new institutional structure should be identified, such as more rational groundwater use fees. In addition, the applicability of creating markets for buying and selling water rights should be examined as a possible source of revenue, along with the need for establishing a reliable water use administration system and measures to protect vulnerable sectors. Appropriate amendments to the following laws will be examined:

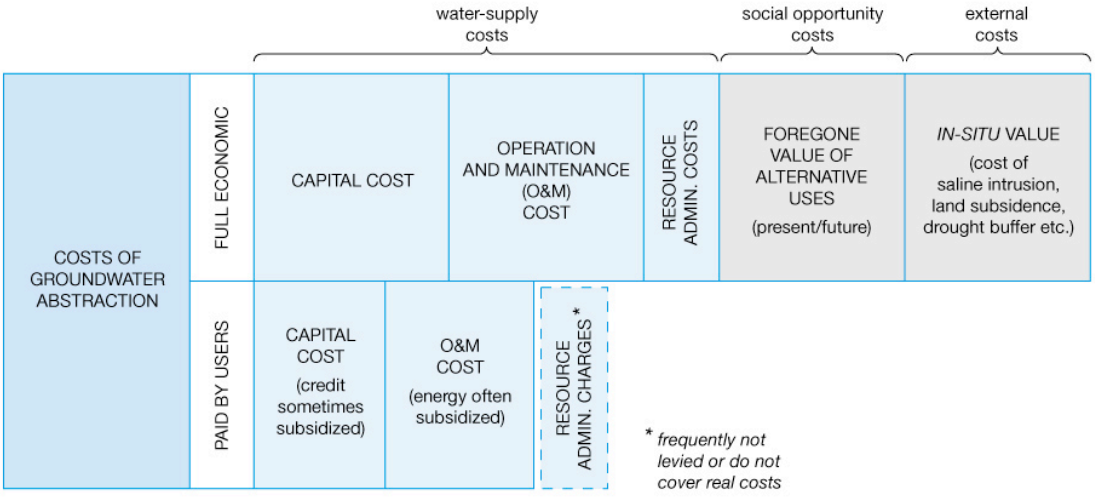
- Re-investment of natural resource use fees for the protection of the environment and the restoration of natural resources (2000)" – to encourage consideration of adopting the basic principle of "water finances water;" and
- Law on fees for the use of water and mineral water (1995)" – to make it more generic to facilitate the notion that water fees should be region-specific and used as instruments to achieve an adopted water management strategy. It should also indicate the procedure of regular water fee reviews and adjustments and the procedure of law enforcement.

Because such measures may require Parliamentary approval, which may take time and encounter challenges, alternative and/or complementary routes should be identified, such as partial budget allocations (coming mainly from mining industry taxes), and direct contributions agreed with the mining industry.

It is worth noting that international and national mining companies with on-going and planned investments in southern Mongolia have expressed interest and support for the activities to strengthen the government's abilities to manage groundwater in southern Mongolia. In discussions with senior mining officials from Rio Tinto, Ivanhoe, South Gobi Sands, and MCS (Energy Resources), all welcomed the idea of extending support to the Government to develop an appropriate framework for managing this important resource. In addition, all of these mining companies indicated a willingness to pay higher tariffs for extracting and using groundwater if the additional monies were dedicated to sustain the new management structure.

The following Figure provides a useful backdrop for assessing the full economic cost of groundwater use (Figure 4). In addition, the portion actually paid by users will be assessed through a case study of one of the priority areas shown in Table 4.

Figure 4. Measuring the Cost of Groundwater Use



Source: GW-MATE BN-7.

Activity 7: Prepare and Implement GW Management Plans[7]

Similar to the "parallel-track" approach already described for strengthening the legal and institutional framework governing groundwater, GWMPs will be prepared and implemented by the WBAs with existing information, while at the same time identifying information gaps and required studies and investigations to be undertaken.

Based on the results of the GWMPs prepared by the WBAs, an overall GWMP will be prepared for the SGR. This integration will be undertaken by the GWMIU with support from qualified consultants. An important task of the WBAs will be to manage the groundwater resources in the Aimag for which they are responsible. This will require that GWMPs be approved by the WBC and other relevant authorities. The first such plan will be prepared by the WBAs with support from the GWMIU. The WBAs GWMPs will be updated every other year, or more frequently as circumstances warrant.

The GWMPs should address the main aspects of groundwater availability, recharge and protection. Specific tasks will include the assessment of:

[7] GW-MATE BN-10.

- groundwater availability;
- groundwater productivity;
- groundwater quality;
- groundwater use and future demand;
- effective recharge of shallow aquifers and the potential to increase their use through water conservation and groundwater storage systems using experiences from India, Yemen and East Africa;
- potential policy issues associated with an integrated approach to industrial and municipal wastewater, and water reuse; and
- current and future groundwater development.

The results of these activities will be presented in the GWMPs prepared by the WBAs. Draft versions of plans will be discussed within the WBC with the participation of all relevant stakeholders. The GWMPs should be as complete as possible with technical and socio-economic aspects elaborated so that decisions may be taken. In particular, any negative effects of groundwater abstraction on existing groundwater sources for urban and rural communities and nomadic herders, or on environmental conditions should be assessed and preventive measures described. "Exit" solutions should also be described and thoroughly discussed with stakeholders.

If alternative scenarios are developed, the WBC will decide on the optimum scenario for implementation. Such scenarios would then be adopted as the WBA GWMPs, which would remain valid until updated.

It is advisable that the recommendations proposed for inclusion in the GWMPs be tested before they are fully implemented or replicated. Given that there seems to be little horizontal physical communication on available hydrogeological information about individual aquifers in the SGR, pilot GWMPs in the Aimag should be implemented in the priority focus areas, as proposed in Table 4. These areas potentially face the most water stress as a result of mining developments and/or planned urban and industrial developments. In the absence of such development, the WBC should first focus on the Aimag center and its immediate surroundings.

Priority Focus Areas by Aimag

AIMAG	AIMAG CENTER	FOCUS AREA	CLARIFICATION
Dundgovi	Mandalgovi	About 20 km diameter around Mandalgovi	Urban development
Omnigovi	Dalanzadgad	Rectangular area around Dalanzadgad: 500 km east-west and 200 km north-south.	Major mining development including Oyu Tolgoi, Tsagaan Tolgoi, Ovoot Tolgoi and Tavan Tolgoi.
Dornogovi	Sainshand	Corridor between Sainshand and Zamyn Uud (border town)	Major industrial development.

According to international experience (GW-MATE BN-6 and GW-MATE SO-1), stakeholder participation, through some level of Aquifer Management Organizations (AMORs), can be indispensable for preparing and implementing GWMPs. Given the limited international experience in establishing such organizations for non-renewable aquifers with few and asymmetrical groups of users as in Mongolia, the

best modality for establishing possible AMORs will be determined as part of the activities to design the GWMPs.

Activity 8: Prepare Groundwater Monitoring Plans

As part of the GWMPs, monitoring groundwater resources will be important and continuous activities of the WBAs. The WBAs will be responsible for preparing plans for monitoring groundwater with the support of qualified consultants. The groundwater monitoring plans (GWMONs) should describe parameters to be monitored, the locations and design of monitoring wells, the observation intervals, and the procedures for processing, storing and disseminating the monitoring data. Groundwater monitoring would be done for natural and non-natural (abstraction) conditions. The purpose of monitoring for natural conditions is to:

- Determine groundwater accumulation conditions (assess recharge and discharge);
- Evaluate groundwater behavior;
- Study the principle of natural recharge rates over time; and
- Determine hydraulic properties and aquifer boundary conditions.

The purpose of monitoring for non-natural ("technogen") conditions is to:

- Carry out groundwater exploration and assess groundwater resources;
- Determine groundwater conditions during exploitation of mineral deposits;
- Validate groundwater resources estimations;
- Assess groundwater conditions during pasture watering and irrigation;
- Predict the variation of groundwater regimes; and
- Protect groundwater from pollution and overexploitation.

The following activities will be carried out to develop effective groundwater monitoring plans:

- Define areas of interest (or define the boundaries of the groundwater body to be managed);
- Define monitoring parameters;
- Define locations and density of monitoring points;
- Design of monitoring points;
- Determine frequency of monitoring;
- Develop a methodology of monitoring (auto, manual); and
- Identify procedures for processing, storing and disseminating monitored data.

The results of the activities described above should be presented in comprehensive groundwater monitoring plans for each Aimag. The GWMONs should specify the activities to be carried out over the years and provide technical specifications and budget requirements. Draft versions of plans should be discussed with the WBC and the WA. Implementation of the GWMONs should be evaluated on an annual basis and adjustments made based on lessons learned.

Activity 9: Purchase and Install Monitoring Equipment

The acquisition and installation of monitoring equipment by individual WBAs will be carried out in consultation with the WA, WBC and other WBAs. The specifications for this equipment should be compatible and able to interface with existing systems. In addition, it is recommended that the same

consultants that help design and implement the systems also contract and supervise the drilling of the required observation wells.

Activity 10: Conduct Groundwater and Water Investigations[8]

The specific investigations to be undertaken will be defined based on the information gaps identified as an early activity of the WBAs, the focus of which should be on problem areas or areas with conflicting water use. Priority should be given to finding out whether there are deep aquifers underlying the SGR, proposing options for more efficient use of water by the mining industry, and understanding the social and environmental consequences of abstraction and pollution related to mining activities in the priority areas shown in Table 4. Key issues to be addressed include:

- The relationship, if any, between deep and shallow aquifers, including what influence the abstraction of groundwater from deeper aquifers will have on shallow aquifer layers (from which nomadic herders get their supply), as well as available options for those users and the corresponding socioeconomic consequence and possible "exit" solutions; and
- What are the water requirements to maintain nature and environmental functions such as the base flow to ephemeral rivers and water availability for natural vegetation like livestock pasture, wildlife, and other ecological functions (GW-MATE BN-16).

To the extent possible, the support and participation of the Mongolian University of Science and Technology should be considered when carrying out research activities.

Activity 11: Monitoring and Enforcement Activities

Based on the results of the legal and institutional assessment, the WBAs may play a role in monitoring and enforcement activities.

Activity 12: Capacity Building Activities

Based on capacity needs assessments, annual plans to develop and build capacity will be prepared by the GWMIU and WBAs, and agreed with the WA and WBC. The capacity building plans will focus on the core activities and selected work programs of the WBAs. Since water management, and more so groundwater management, is relatively new at the Aimag level, the work program will be determined based on priority issues.

Possible training options for the GWMIU and WBAs are identified in the following table. Where possible and appropriate, the training programs should make use of courses that are being provided by mining sector enterprises, such as for Oyu Tolgoi and which would be open to GOM staff. Such courses might include English training, and technical topics such as hydrogeology, environmental issues, monitoring, water quality, modeling and drilling.

Advantage should be taken of existing materials on groundwater, such as GW-MATE's publications in English and the IWRM Dutch Project's handbooks in Mongolian. In addition, a program to train trainers will be prepared during the first year of implementation and implemented in the

[8] For an updated review of groundwater resources in the SGR see Tuinhof & Buyanhishig 2010.

subsequent years. A decision on the feasibility of producing a "Training of Trainers Manual" in Mongolian and adapted to the SGR's specific situation should be considered.

Possible Training Topics

Topic	Participants	Level	Comments
Groundwater Management in IWRM for WBC	WBC members and GWMIU staff	Introduction	Training of IWRM principles for groundwater management,
Groundwater resources planning	WBC members and GWMIU staff	Introduction	Preparation of a groundwater plan
Database development	GWMIU and WBAs staff (hydrogeologist, GIS-database expert)	Advanced	In coordination with WA-GWMIU (central level database – data exchange)
GIS application	WBAs staff (hydro-geologist, GIS-database expert)	Advanced	Via NGIC project and/or NUM lab.: database connection, map production, etc.
Legal principles	WBC members, GWMIU staff and WBAs staff	Introduction	Constitutional provisions for water, the Water Law of 2004 and related legislation such as the Land Law, environmental protection legislation, etc.
Stakeholder participation	WBC members, GWMIU staff and WBAs staff	Introduction	Understanding that socially-sustainable groundwater management is not possible without stakeholder participation,
Information and communication	WBC Chairman and Secretary	Introduction	Especially for WBC
Information and Communication System	Technical and socioeconomic professionals, stakeholders	Introduction and advanced	Understand how to feed and retrieve information, and its usefulness.
Water quality	WBAs staff	Introduction / advanced	Understanding water quality standards, analysis and presentation of data
Groundwater (various courses possible)	WBAs staff	Introduction / advanced	Groundwater monitoring, pumping test analysis, groundwater modeling, etc.
Water well operation basics	Groundwater rural users	Introduction	pump operation, filter maintenance, well protection from livestock pollution, construction of dug wells (or hand wells as called in Mongolia)

NOTE: The introductory courses should be taken by as many of the staff as possible to contribute to interdisciplinary interaction. Training can be provided by national and international consultants, GWMIU staff and/or professors form the Mongolian University of Science and Technology.

Supervision

At least once a year, formal missions to supervise and record progress and emerging challenges in implementing the AusAID Program will be carried out. Every effort should be made to coordinate missions with those for the MINIS, and single reports incorporating the findings of the MINIS and AusAID Program should be prepared and submitted to counterparts.

Representatives of the World Bank, AusAID, GOM officials and consultants (as needed) will be expected to participate in the missions. At the end of each supervision mission, aide memoires will be produced and forwarded to the Ministry of Finance and copied to other concerned ministries and agencies.

Annex C: Program Management & Implementation Arrangements

Structure and Management of AusAID Funds

The same institutional arrangements that are used by the World Bank to manage trust funds on behalf of other donors would apply to the AusAID Program. The World Bank will serve as administrator of the AusAID funds and be responsible for overall management of the Program. The World Bank will ensure that AusAID is given opportunity to participate during implementation and that all of AusAID's reporting and monitoring and evaluation requirements are met.

An Umbrella Trust Fund arrangement between the World Bank and AusAID should be set-up to facilitate any future AusAID contributions for Mongolia to be managed by the World Bank. This provides a flexible framework for future contributions and will reduce transaction costs for all partners. The support for groundwater will be the first activity for Mongolia under the AusAID-World Bank framework.

For the AusAID Program on groundwater, an Administrative Agreement (AA) between AusAID and the World Bank would be prepared by the World Bank's Country Lawyer and circulated to Australian officials for comment. Once finalized, the AA would be signed by the relevant parties and the MINIS would be formally restructured to reflect the AusAID funding. Because the AusAID funds would be executed by the MOF (Recipient-executed), there would be a separate Grant Agreement signed by the Ministry of Finance and the World Bank to reflect this arrangement.

Implementation Period

It is anticipated that the AusAID Program will be implemented over a four and one-half year period between April 1, 2012 and September 30, 2016, the expected closing date of the MINIS.

Based on receiving AusAID's approval for the Program by March 31, 2012, the expected milestones for establishing key groundwater entities include:

- WBC established and Director appointed (June 30, 2012);
- GWMIU established, staffed and functional (August 31, 2012); and
- Three WBAs established, staffed and functional (September 30, 2012).

Roles and Responsibilities

World Bank. A core team of specialists has been assigned to oversee and supervise the AusAID Program during implementation, ensure that funds are used for their intended purpose and within the allocated budget, and provide regular updates on progress. The core team consists of a Task Team Leader, a Procurement Specialist, and a Financial Management Specialist. In addition, the World Bank's Trust Funds Department in Washington, DC will monitor Program activities, while the Loan and Disbursements Team in Manila, Philippines will ensure that all required documentation is available before releasing AusAID funds.

Government Counterparts. The WA, which is an agency of the MNET, will have responsibility for implementing all technical aspects of the AusAID Program. The National Water Committee would also likely play a prominent role. Other Ministries would not be affected by the Program's work, but they are expected to become partners, supporters and users of the new framework. Stakeholders are expected

to include the Aimag and Soum level governments, NGOs, community representatives, and mining companies.

AusAID. It is expected that AusAID officials will participate in implementation when possible, including participating in missions to supervise the Program, commenting on outputs produced by consultants and specialists, participating in any workshops that might be organised and meeting with the World Bank regularly to discuss implementation progress.

Implementing Agency. The Ministry of Finance (MOF) is the implementing agency for both the MINIS and the AusAID Program. A Project Management Unit (PMU) has been established at the MOF. The MOF will manage the MINIS and the AusAID Program on behalf of project beneficiaries from other ministries and agencies. The PMU will be responsible for: (i) procurement of all services, goods and equipment; (ii) financial record keeping, reporting and disbursements; (iii) project monitoring and reporting; and (iv) the contractual obligations.

A PMU Director has been hired to oversee implementation of the MINIS and the AusAID Program and will report to the State Secretary for Finance. The PMU Director will have overall responsibility for managing the AusAID Program, including:

(i) implementing activities within budget and according to schedule;

(ii) managing all procurement activities, including contracting consultants, and purchasing goods and equipment;

(iii) overseeing financial record keeping, disbursements, the designated and operating accounts, and financial reporting;

(iv) monitoring the performance of consultants to ensure that contractual obligations are fulfilled;

(v) with the support of relevant technical specialists from the WA, reviewing and approving all reports and outputs issued by consultants;

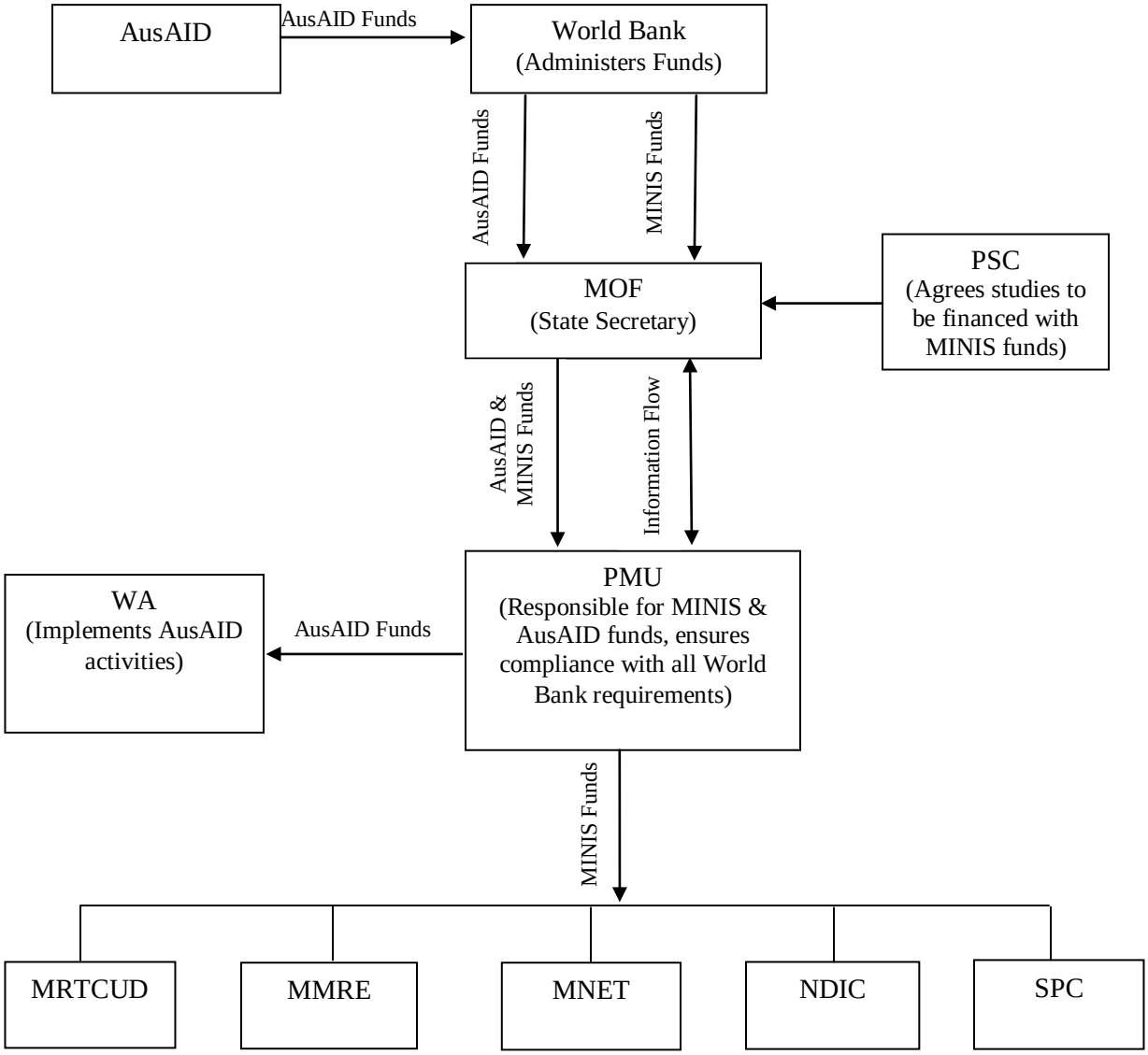
(vi) gathering progress and evaluation of Program activities, and providing consolidated reports on implementation progress; and

(vii) ensuring that the environmental and social safeguards framework is effectively implemented.

Fiduciary Aspects. The PMU will carry out the procurement and financial management of specific activities on behalf of the WA. The MOF will work with the WA and other relevant ministries and agencies to garner support in managing the technical aspects of the AusAID Program, including preparing terms of reference, and implementing, monitoring, evaluating and providing comments on the activities and specific outputs. Local and/or international consultants may be hired to support the technical specialists in these duties. It will also be the MOF's responsibility to ensure that the Ministry of Nature, Environment and Tourism provides sufficient resources and properly staffs up the WBC, three WBAs, and the GWMIU at the WA.

A Procurement Specialist and Financial Management Specialist have been hired as part of the PMU to manage the fiduciary requirements of the MINIS and the AusAID Program. These costs will be financed through the MINIS and not from the AusAID Program. Both the Procurement Specialist and Financial Management Specialist will carry out their respective responsibilities according to the World Bank's policies and procedures.

The following organizational chart provides an overview of roles and responsibilities of the principal organizations involved in the AusAID Program.



Develop TORs, participate in tender process, monitor and provide technical input, implement MINIS activities.

Key:

MOF	Ministry of Finance
PSC	Project Steering Committee
PMU	Project Management Unit
WA	Water Authority
MRTCUD	Ministry of Roads, Transport, Construction & Urban Development
MMRE	Ministry of Mineral Resources & Energy
MNET	Ministry of Nature, Environment & Tourism
NDIC	National Development & Innovation Committee
SPC	State Property Committee

Project Implementation Manual. A Project Implementation Manual (PIM), which includes a Financial Management Manual, has been prepared to guide implementation of the MINIS and AusAID Program. The PIM provides job descriptions, details arrangements for implementing the MINIS and AusAID Program, defines training programs on Bank fiduciary and safeguard requirements, and provides templates for reporting, and guidance on monitoring.

Monitoring and Evaluation. The PMU will issue quarterly and annual progress reports. Quarterly reports will be due the last day of April, July, October and January, while the annual report will be delivered by the end of February. A mid-term review will be prepared in 2013, and an Implementation Completion Report will be completed within six months of project closing. The PMU will also monitor progress against agreed performance indicators, as defined in Annex 3 of the Project Appraisal Document for the MINIS, and the expected outcomes of the AusAID Program (Annex E). Advisory teams supporting the Government in the preparation of feasibility studies and specific transactions will provide regular input to the PMU Director about project progress.

Based on the Bank's review of quarterly reports and the results of supervision missions, the PMU will take measures to ensure that MINIS components and AusAID activities are implemented without delay and according to schedule so that the development objectives can be achieved.

Financial Audits. The Government of Mongolia (GOM) will appoint an independent external auditor, acceptable to the Bank, to conduct annual audits of the project's accounts in accordance with International Standards on Auditing, under terms of reference satisfactory to the Bank. The audits will be financed from Credit proceeds.

WBC, WBAs and GWMIU Costs. Funding will be provided to contract technical specialists for the WBC, three WBAs and GWMIU, acquire needed office equipment, pay operating costs, and purchase three vehicles for the WBAs.

Information Sharing

It is planned that all relevant information produced during the course of the AusAID Program, including consultant outputs, reports and workshop materials, will be made available to water users and the public at large. In addition, it may be posted on the World Bank's website for Mongolia, as well as appropriate Government websites.

Annex D: Detailed Budget

Estimated Program Costs

Program Activity	Unit	No. of Units	Unit Cost (in US$)	Total Cost (in US$)	Reference to Procurement Plan
1. Groundwater Management & Information Unit				**381,050**	
1.1 National Coordinator/Sr. Hydrogeologist	Month	54	2,200	118,800	3.9.1
1.2 GIS Database Specialist	Month	54	2,000	108,000	3.9.2
1.3 Socio-Economic Development Specialist	Month	54	2,000	108,000	3.9.3
1.4 Office Hardware & Software	One-Time Cost	1	12,500	12,500	3.6.1
1.5 Operating Costs	Year	4.5	3,000	13,500	3.11.3
1.6 Translation Costs (verbal & written)	Year	4.5	2,500	11,250	3.11.2
1.7 Transportation Costs	Year	4.5	2,000	9,000	3.11.1
2. Water Basin Council (One)				**159,450**	
2.1 Administrative Secretary	Month	54	800	43,200	3.8.1
2.2 Office Furniture	One-Time Cost	1	10,000	10,000	3.6.1
2.3 Office Hardware & Software	One-Time Cost	1	5,000	5,000	3.6.1
2.4 Operating Costs	Year	4.5	12,000	54,000	3.11.3
2.5 Translation Costs	Year	4.5	2,500	11,250	3.11.2
2.6 Transport to/from Rotational Meetings (2 p.a.)	Trip	9	4,000	36,000	3.11.1
3. Water Basin Administrations (Three)				**3,142,950**	
3.1 Director/Sr. Hydrogeologist	Month	162	2,500	405,000	3.10.1
3.2 Water Quality Engineer	Month	162	2,100	340,200	3.10.2
3.3 Water Engineer	Month	162	2,100	340,200	3.10.3
3.4 GIS Database Specialist	Month	162	2,100	340,200	3.10.4
3.5 Socio-Economic Development Specialist	Month	162	2,100	340,200	3.10.5
3.6 Office Accountant (4 weeks per year)	Week	54	400	21,600	3.10.6
3.7 Driver	Month	162	1,400	226,800	3.10.7
3.8 Vehicle	One-Time Cost	3	65,000	195,000	3.6.2
3.9 Office Furniture	One-Time Cost	3	40,000	120,000	3.6.1
3.10 Office Hardware & Software	One-Time Cost	3	15,000	45,000	3.6.1
3.11 Field Equipment	One-Time Cost	3	20,000	60,000	3.6.1
3.12 Operating Costs (per WBA, includes vehicle operating costs)	Year	13.5	50,000	675,000	3.11.3
3.13 Translation Costs (verbal & written)	Year	13.5	2,500	33,750	3.11.2
4. Consultant Services				**2,690,000**	
4.1 Prepare TORs for Consultancy Assignments	Year	3	25,000	75,000	3.5.1
4.2 Assess Legal/Institutional Framework	Study	1	75,000	75,000	3.5.7
4.3 Purchase & Install Management Information Systems	Package	3	15,000	45,000	3.6.4
4.4 Implement I&C System	Package	1	30,000	30,000	3.5.8
4.5 Gather Existing Data	On-Going	3	40,000	120,000	3.5.4
4.6 Identify Sustainable Revenue Sources	Study	1	125,000	125,000	3.5.9
4.7 Prepare & Implement GW Management Plans (per WBA)	Plan	3	150,000	450,000	3.5.3
4.8 Prepare GW Monitoring Plans (per WBA)	Plan	3	40,000	120,000	3.5.2
4.9 Install Monitoring Equipment (per WBA)	Year	12	70,000	840,000	3.5.6
4.10 Conduct Groundwater Investigations (per WBA)	Year	13.5	60,000	810,000	3.5.5
5. Capacity Building Activities				**330,750**	
5.1 Training in Mongolia ("training of trainers")	Year	4.5	40,000	180,000	3.7.1
5.2 Training Fees Abroad (3 staff per WBA)	Year	13.5	2,500	33,750	3.7.2
5.3 Transportation (int'l training events, 3 staff per WBA)	Year	13.5	7,500	101,250	3.7.3
5.4 Interpreters (per year)	Year	4.5	3,500	15,750	3.11.2
6. Supervision Activities				**337,500**	
6.1 World Bank and Consultants (fees & travel)	Year	4.5	75,000	337,500	
7. World Bank Fees				**387,085**	
7.1 Set-up Trust Fund	One-Time Fee	1	35,000	35,000	
7.2 Management Fees (5% of amount)	On-Going Fee			352,085	
Total Baseline Costs:				**7,041,700**	
Estimated Total Program Cost:				**7,428,785**	

Annex E: Monitoring and Evaluation Framework

Development Objective	Strengthen the capacity of authorities to manage and protect groundwater resources in Southern Mongolia.			
Outcome Indicator	**Indicator**		**Means of Verification**	**Risks and Assumptions**
	Baseline	**Target**		
Tools available to ensure sustainable development of groundwater resources in Southern Mongolia.	Tools not available.	Hydrogeological databases, water level recording systems, water management plans available.	Tools functioning and in use by WBAs.	Qualified staff available to operate tools.
Agreement to implement important recommendations from water resource pricing studies.	Tariffs not based on GW as a non-renewable resource.	Agreement on recommendations for tariffs based on GW as a non-renewable resource.	Water resource pricing studies completed, and revised water tariff regime.	Water tariffs do not become political issue.
Officials are equipped to undertake the tasks under the 29 Water Basin Framework.	Capacity & resources lacking.	• Capacity of officials improved. • Information management systems purchased. • Best technologies for GW conservation and reuse mainstreamed.	• Capacity building programs completed. • Information systems operational and in use. • Technologies in use at WBAs.	Those officials trained continue to work with Water Authority and WBAs.
GW use and impact are regularly monitored.	Information on GW use limited.	• Gather existing information & identify gaps in understanding of GW. • Water needs of herders & communities known. • GW monitoring plans prepared.	• Information stored in database, gaps identified, spatial and lateral overviews of GW available. • Plans for supplying water to various users available. • GW monitoring plans implemented.	No legal, regulatory or institutional obstacles to monitoring GW use.
Monitoring plans are available to stakeholders.	No plans exist.	Monitoring plans current & readily available.	Regular meetings of WBC are held.	WBC is fully functional.
Potential to exploit GW for development is understood.	Availability of GW not known.	Extent and quality of GW known.	Allocation & pricing of GW based on revised tariff regime.	WBAs are fully functional.

Annex F: Procurement Arrangements

A. General

Procurement for the AusAID Program will be carried out in accordance with the World Bank's "Guidelines: Procurement under IBRD Loans and IDA Credits," dated January 2011; and "Guidelines: Selection and Employment of Consultants by World Bank Borrowers," dated January 2011, and the provisions stipulated in the Legal Agreements. The various items under different expenditure categories are described in general below. For each contract to be financed by under the Program, the different procurement methods or consultant selection methods, the need for pre-qualification, estimated costs, prior review requirements, and time frame are agreed in the Procurement Plan. The Procurement Plan will be updated at least annually, or as required to reflect actual project implementation needs and improvements in institutional capacity.

Procurement of Works. Works will not be financed under the AusAID Program.

Procurement of Goods. A total amount of US$0.450 million is expected to be used to procure goods and equipment for the WBAs. For each WBA, goods procured under the AusAID Program are expected to include: office equipment and furniture, desktop computers, laptops, office software, GIS software, groundwater modeling software, monitoring equipment, printers, radios, books, field equipment, and one vehicle. The procurement will be done using the Bank's standard bidding documents (SBDs) for all International Competitive Bidding.

- ***International Competitive Bidding (ICB).*** Any contract for goods estimated to cost US$50,000 equivalent or more shall be procured under ICB procedures specified in the Procurement Guidelines.

- ***Shopping.*** Any contract for goods with cost estimate of less than US$50,000 equivalent per contract may be procured under shopping procedures as specified in Para. 3.5 of the Procurement Guidelines.

- ***Direct Contracting***. Equipment, including standard software with proprietary nature and obtained only from one source, or which meet other circumstances as specified in Para. 3.6 of the Procurement Guidelines will be procured on the basis of direct contracting.

Selection of Consultants. An estimated amount of US$5.906 million will be required for consultant services and training. Services can be expected to include: (i) technical reviews and assessments; (ii) drilling a limited number of boreholes and equipping them with monitoring equipment; (iii) taking inventories; (iv) carrying out quality surveys; (v) developing management and monitoring plans; (vi) staff costs of WBC, WBAs and GWMIU; and (vii) formal training events, both within Mongolia and abroad. Short lists of consultants for services estimated to cost less than US$100,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines. Services are expected to be provided by both consulting firms and individual consultants.

Selection of Consulting Firms. Contracts expected to cost more than US$200,000 equivalent per contract will use the Quality and Cost Based Selection (QCBS) or Quality Based Selection (QBS) processes as appropriate in accordance with the relevant provisions of the *Consultant Guidelines.* For the selection of auditors, Least Cost Selection (LCS) procedures will be used. Under the circumstances

stipulated in the *Consultant Guidelines*, Consultants may also be selected based on Selection Based on the Consultants' Qualification (CQS) method and Single-Source Selection (SSS) basis. The Bank's Standard Request for Proposals (SRFP) shall be used for the selection of consulting firms.

Selection of Individual Consultants. Individual consultants will be selected and awarded in accordance with the provisions of Section V of the Consultants Guidelines. Individual consultants may also be selected on a sole source basis, subject to the Bank's prior approval.

Training and Workshops. A total amount of US$0.330 million will be used to finance travel-related costs and fees for training events and workshops abroad. In addition, proceeds will be used to fund logistics of events organized in Mongolia, including venue fees, translation and printing of workshop documents, simultaneous translation, meals and coffee/tea breaks for participants, and banners.

Incremental Operating Costs. A total amount of US$0.743 million will be used to finance incremental operating costs. These costs are related to office rents, office supplies and communications services for the PMU, translation and printing of key documents, including materials from training sessions, in-country travel costs, lodging and per diems for WBA and GWMIU staff, and advertising expenses and banking charges incurred in connection with the management and coordination of Program activities.

B. Assessment of the Agency's Capacity to Implement Procurement

Procurement activities for the AusAID Program will be carried out by the recently established PMU, which will be responsible for overall coordination and management of the MINIS, including: (i) monitoring and evaluation activities; (ii) reporting on implementation progress; (iii) the procurement process; (iv) all fiduciary requirements associated with financial management and audits; (v) effective implementation of the environmental and social safeguards framework; and (vi) implementing the Program within budget and according to schedule. The PMU is staffed with a Director, and specialists in procurement and financial management.

An assessment of the capacity of the Implementing Agency (MOF) to carry out procurement for the Program according to Bank guidelines and procedures was carried out by the Team's Procurement Specialist between December 20 and 22, 2010. The assessment reviewed MOF's organizational structure and functions, past experience, staff skills, quality and adequacy of supporting and control systems, legal and regulatory framework. Overall, MOF has adequate experience in implementing World Bank funded projects. However, the assessment considered some risks associated with the project procurement such as lack of qualified procurement people, those who make procurement decision and project champions may be changed (turnover in key government positions is not uncommon in Mongolia, especially with demand from mining companies offering high wages) and work load of technical staff involved in the project procurement process and decision making may not allow to allocate their time fully which may affect the quality of the project procurement. With the mitigating measures provided in the assessment report, the overall procurement risk rating for the MINIS is **moderate**.

C. Procurement Plan

A procurement plan for the AusAID Program was prepared. The Procurement Plan, which defines the basis for the procurement methods, will be available at the GWMIU, Water Authority, MOF and other appropriate government agencies. It will also be available in the Program's database and on the Bank's external website. The Procurement Plan will be updated annually, or as required to reflect actual implementation needs and/or changes in institutional capacity.

D. Details of the Procurement Arrangements Involving International Competition

Goods and Non-Consulting Services

Works will not be financed under the Program. All contracts in excess of US$50,000 for goods and all direct contracting contracts, regardless of contract value, and the first three shopping contracts will be subject to prior review by the Bank.

All other contracts will be subject to ex-post review by supervision missions. The post review sampling ratio should be no less than one out of five contracts.

Consulting Services

Consultancy services with firms estimated to cost US$100,000 or more per contract, individual consultant assignments estimated to cost US$50,000 or more, single source selection of consultants (firms) and sole-source selection of individuals regardless of contract value will be subject to prior review by the Bank.

Short lists of consultants for services estimated to cost less than US$100,000 equivalent per contract, may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

Procurement Plan /1
(as of December 19, 2011)

Thresholds of Procurement Methods and Prior Review

Abbreviations:

ICB	International Competitive Bidding
NCB	National Competitive Bidding
Shopping	Procurement method as specified in article 3.5 of the Bank's Procurement Guidelines
Direct Contracting	Procurement method as specified in article 3.6 of the Bank's Procurement Guidelines
QCBS	Quality- and Cost- Based Selection
QBS	Quality-Based Selection
CQS	Selection Based on the Consultants' Qualifications
SSS	Single-Source Selection
LCS	Least-Cost Selection
IC	Selection of Individual Consultants

Procurement Method		**Threshold**	**Prior Review Threshold**
Goods	ICB	≥ US$100,000	For goods, all contracts above US$50,000 and the first three shopping contracts, regardless of contract value. All direct contracting, irrespective of value, will be subject to the Bank's prior review.
	NCB	< US$100,000	
	Shopping	< US$50,000	
	Direct Contracting	Contracts for procurement of copy rights, royalties, as well as software and printed copies of books, meeting the requirements of Article 3.6 of the Procurement Guidelines.	
Consulting Services 2/	QCBS	≥ US$200,000	US$100,000 for firms, US$50,000 for individuals, and single source selection of consultants (firms) and sole-source selection of Individuals, regardless of
	QBS	> Assignments which meet paragraph 3.2 of the Consultant Guidelines.	

Procurement Method		Threshold	Prior Review Threshold
	CQS	< US$200,000	contract value.
	SSS	Assignments meeting the requirements of paragraphs 3.10-3.12 of the Consultant Guidelines	
	LCS	All assignments for auditing PMU accounts, regardless contract value	
	IC	Assignments meeting the requirements of Para. 5.1 and 5.3 of the Consultant Guidelines	

Notes:

/1 All activities financed with AusAID funds will be carried out in accordance with World Bank procurement policies and procedures.

/2 Shortlists composed entirely of national consultants for services estimated to cost less than US$100,000 equivalent per contract may be composed entirely of national consultants in accordance with the provisions of paragraph 2.7 of the Consultant Guidelines.

Procurement Plan
January 1, 2012 to September 30, 2016

Contract	Description of Contract	Estimated Cost (US$)	Procurement Method	Review by Bank (Prior/Post)	Implementation Schedule			
					Procurement Process			Contract Completion
					Invite Proposals	Receive Proposals	Award Contract	
3	**Groundwater Management**							
3.5	***Consultant Services***							
3.5.1	Preparation of TORs for AusAID work	90,000	CQS	Post	Jun 2012	Aug 2012	Oct 2012	Mar 2015
3.5.2	Groundwater monitoring plan (multiple contracts)	120,000	CQS	Post	Sep 2012	Oct 2012	Oct 2012	Dec 2012
3.5.3	Developing water management plan and updating (multiple contracts)	450,000	CQS	Post	Nov 2012	Nov 2012	Dec 2012	Mar 2013
3.5.4	Gather existing data	135,000	CQS	Post	Nov 2012	Nov 2012	Dec 2012	Mar 2013
3.5.5	Groundwater investigation (multiple contracts)	810,000	CQS	Post	Nov 2012	Nov 2012	Dec 2012	Mar 2013
3.5.6	Monitoring and enforcement activities	840,000	CQS	Post	Nov 2012	Nov 2012	Dec 2012	Mar 2013
3.5.7	Assess legal/institutional framework	100,000	CQS	Post	Nov 2012	Nov 2012	Dec 2012	Mar 2013
3.5.8	Implement I&C system	30,000	CQS	Post	Nov 2012	Nov 2012	Dec 2012	Mar 2013
3.5.9	Identifying sustainable revenue source	125,000	ICB	Prior	Jun 2012	Jun 2012	Jun 2012	Sep 2012

3.6	***Non-Consulting Services/Goods***							
3.6.1	Purchase of office equipment (furniture, desktop computers, lap-tops, printers, radios, office software, GIS software, groundwater modeling software, books and field office equipment)	345,000	Shopping	Prior	Jun 2012	Jun 2012	Jun 2012	Jun 2012
3.6.2	Field office vehicles (one for each WBA, total of 3)	195,000	Shopping	Prior	Jun 2012	Jun 2012	Jun 2012	Jun 2012
3.6.3	Purchase/install MIS system	45,000	Shopping	Post	Jun 2012	Jun 2012	Jun 2012	Jun 2012
3.7	***Training/Capacity Building***							
3.7.1	Capacity building activities (training in Mongolia, training of trainers)	180,000	Disbursed against reasonable actual costs	NA	Jun 2012	Jul 2012	Jul 2012	Sep 2016
3.7.2	Capacity building activities (abroad training)	33,750	Disbursed against reasonable actual costs	NA	Jun 2012	Jul 2012	Jul 2012	Sep 2016
3.7.3	International training events (3 staff per WBA)	101,250	Disbursed against reasonable actual costs	NA	Jun 2012	Jul 2012	Jul 2012	Sep 2016

3.8	***Water Basin Counsel (One)***							
3.8.1	Administrative secretary	43,200	IC	Post	Jun 2012	Jul 2012	Jul 2012	Sep 2016
3.9	***Groundwater Management and Information Unit (One)***							
3.9.1	Groundwater management unit national coordinator /Senior Hydro geologist	135,000	IC	Post	May 202	Jun 2012	Jun 2012	Sep 2016
3.9.2	Groundwater management unit GIS database specialist	118,800	IC	Post	May 202	Jun 2012	Jun 2012	Sep 2016
3.9.3	Socio-Economic Development specialist	118,800	IC	Post	May 202	Jun 2012	Jun 2012	Sep 2016
3.10	***Water Basin Administrations (Three)***							
3.10.1	Director/Sr. Hydrogeologist for each WBA (3 individuals)	453,600	IC	Post	May 202	Jun 2012	Jun 2012	Sep 2016
3.10.2	Water quality engineer (3 individuals)	372,600	IC	Post	May 202	Jun 2012	Jun 2012	Sep 2016
3.10.3	Water engineer (3 individuals)	372,600	IC	Post	May 202	Jun 2012	Jun 2012	Sep 2016
3.10.4	GIS Database specialist (3 individuals)	372,600	IC	Post	May 202	Jun 2012	Jun 2012	Sep 2016
3.10.5	Socio-Economic Development specialist (3 individuals)	372,600	IC	Post	May 202	Jun 2012	Jun 2012	Sep 2016
3.10.6	Office accountant to the Groundwater basin Administration at each office (3 individuals)	21,600	IC	Post	May 202	Jun 2012	Jun 2012	Sep 2016
3.10.7	Drivers	243,000	IC	Post	May 202	Jun 2012	Jun 2012	Sep 2016
3.11	***WBC, WBAs GWMIU Operating Costs***							

3.11.1	Transportation costs	47,250	Disbursed against reasonable actual costs	NA	Jun 2012	Jun 2012	Jun 2012	Sep 2016
3.11.2	Translation cost of WBA, WBC and GWMIU	72,000	Disbursed against reasonable actual costs	NA	Jun 2012	Jun 2012	Jun 2012	Sep 2016
3.11.3	Office operating costs of WBA, WBC, GWMIU offices (for 3 locations for 4.5 years, including office rent, local staff DSA, office communication cost, internet fee, office supply, advertisement and material shipping cost)	745,200	Disbursed against reasonable actual costs	NA	NA	NA	NA	NA
	Total Program Cost:	**US$7,214,850**						

Annex G: Financial Management Arrangements

Implementation Arrangements

The MINIS will be implemented by the Project Management Unit (PMU) established at the Ministry of Finance (MOF). The MOF will manage the MINIS, including the fiduciary aspects, on behalf of the project beneficiaries.

A Project Steering Committee (PSC) chaired by the State Secretary of MOF will be established to agree and oversee the use of project funds. This committee will be comprised of representatives from key line ministries and agencies.

The PMU will be responsible for the day-to-day project implementation and management work. The PMU is comprised of a PMU Director, a Procurement Officer (PO) and a Finance Officer (FO). The PMU Director will oversee implementation of the MINIS and will report to the State Secretary of MOF. The FO is responsible for budget preparation and execution, financial management including operation of the Designated Accounts (DAs) and Operating Accounts (OAs), disbursement, accounting and financial reporting. Technical specialists are expected to be contracted, from time-to-time, to support the work of the PMU.

The PMU will be responsible for overall coordination of the fiduciary aspects of the project including financial management, accounting, and auditing. In particular, it will be at least responsible for, but not limited to the following:

- Designing and establishing a computerized financial management system including assigning a chart of accounts;
- Maintaining up-to-date accounting records and ledgers as well as asset management;
- Preparing project financing plans on a monthly, quarterly, and annual basis;
- Conducting variance analysis on project financial position and take further actions;
- Recording transactions for all project activities;
- Managing and maintaining the DA and OA;
- Preparing monthly bank reconciliation statements in a timely manner;
- Preparing SOEs, withdrawal applications, and supplier records;
- Ensuring that a proper internal control system is in place to achieve accountability at all levels;
- Preparing quarterly IFRs as part of Project Progress Reports and submitting them to the Bank;
- Preparing annual financial statements in accordance with consistently applied accounting standards acceptable to the Bank;
- Submitting audit reports;
- Properly filing and maintaining all accounting forms and supporting documents; and
- Such other tasks as assigned.

Once the AusAID funds are delivered to the Bank, the financial management arrangements (funds flow and disbursement, accounting and bookkeeping, financial reporting, and external auditing) previously assessed and agreed for the Program will be followed and those have been summarized in this document.

Flow of Funds and Disbursement Arrangements

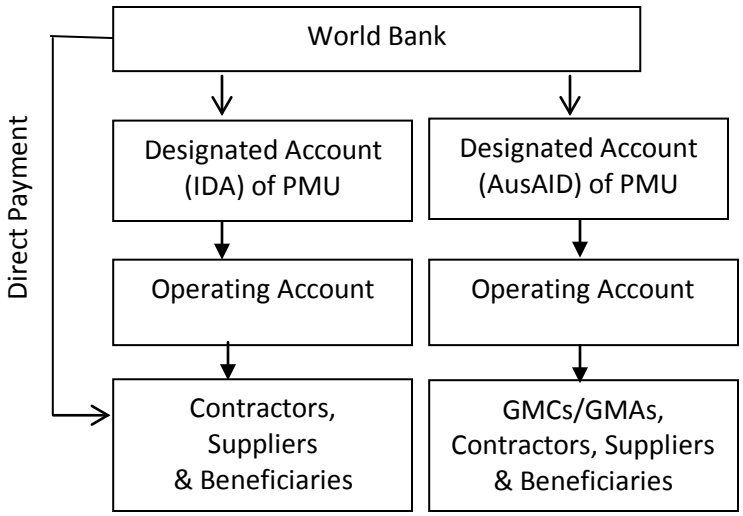
The PMU will open and manage separate USD Designated Accounts (DAs) for the IDA and AusAID funds at a commercial bank acceptable to the Bank. Funds from the AusAID DA will only be disbursed against eligible expenditures under Component 3 of the MINIS with appropriate approvals from the PMU Director and the authorized representatives from MOF. The AusAID DA ceiling will be discussed and agreed between the Bank and recipient and will be specified in the Bank's Disbursement Letter.

Further advances will be made from the AusAID DA to an OA for AusAID to be opened at the same commercial bank where the project's DAs are located. The AusAID OA will be used to finance small expenditures relating to incremental operating costs of the WBC and the local WBAs under the Water Authority. The OA will be maintained in Mongolian Tugrug by the PMU, and will have a ceiling of an equivalent of US$20,000. Uses of the advance in the AusAID OA will be reported and reconciled with the AusAID DA on a monthly basis. The outstanding balance of the OA will be reported as a separate item in the DA reconciliation statement that is submitted together with the DA withdrawal applications to the Bank.

Further advances from the AusAID OA can be made to the local GMA accounts in the form of petty cash (through a bank transfer) to cover small recurring operating expenses of the GMAs e.g. fuel, stationary, office supplies, etc. The petty cash ceiling shall not exceed an equivalent of US$500. Petty cash balances will be reconciled with the OA balance on a monthly basis. The GMAs/GMCs will be responsible for providing copies of the petty cash expenditures to the PMU for accounting and reporting purposes.

Bank-financed projects may be transferred into the Treasury single account system within the Government Financial Management Information System. If/when such arrangement is confirmed, the DA arrangement will be revised accordingly.

The funds flow of the project will be as follows:



The PMU will prepare withdrawal applications. The PMU Director will ensure the completeness and accuracy of all withdrawal applications and append his/her signature as part of the internal control procedures. All Bank withdrawal applications will be signed off by the PMU Director and the authorized representatives from MOF.

Four disbursement methods, including advance, reimbursement, direct payment and special commitments, will be available to the AusAID Program. Supporting documents for disbursement will be statements of expenditure (SOEs) or summary sheets (SS) which will attached with records like contracts and invoices. The use of SOEs will be in line with the Bank's procurement post review threshold for the project. Supporting documents required for Bank disbursements under different disbursement methods are documented in the Disbursement Letter issued by the Bank.

For reporting eligible expenditures paid from the DA for requesting for reimbursement:

(a) List of payments against contracts, together with records evidencing eligible expenditures (e.g., copies of receipts, supplier invoices) for the contracts subject to the Bank's prior review;

(b) Statements of expenditure in the form detailed in the Disbursement letter for all other expenditure/contracts not subject to the Bank's prior review; and

(c) A Designated Account Reconciliation Statements with applicable bank statement for reporting eligible expenditure paid from the Designated Account.

For requests for Direct Payment

(d) Records evidencing eligible expenditures, e.g. copies of receipts, supplier invoices.

Accounting and Bookkeeping

The administration, accounting, and reporting of the Program will be set up in accordance with Bank requirements, which obligates the recipient to prepare financial statements in accordance with acceptable accounting standards. The Bank does not mandate a format for annual financial statements, however, where a recipient prepares financial statements on a modified cash basis, the Bank encourages the adoption of formats laid out in the International Public Sector Accounting Standards (IPSAS), and Financial Reporting under the Modified Cash Basis of Accounting, in order to monitor and fully reflect any non-cash transactions and payables. The PMU will adopt the modified cash basis of accounting for preparing financial statements. Consistent with IPSAS requirements, the financial statements will include the following:

- Balance Sheet of the Project;
- Statement of Sources and Uses of Funds by Project Components;
- Statement of Implementation of Credit Proceeds;
- Statement of Designated Account for the Credit; and
- Notes to the financial statements.

Program accounts and records will be maintained by the PMU, which will operate and maintain a financial management information system capable of generating the project Interim Financial Reports (IFRs) in accordance with formats to be agreed with the Bank.

As the PMU will manage all aspects of the Program's financial management, it will be responsible for recording project accounts, preparing project financial statements, and retaining all disbursement supporting documents, as well as processing of withdrawal applications throughout the life of the Program.

To strengthen financial management capacity and achieve consistent quality of accounting, the PMU will prepare and use a FMM. The FMM, which is a part of the Project Implementation Manual (PIM), will

provide detailed guidelines on financial management, including internal controls, accounting procedures, fund and asset management, procedures for preparing withdrawal application, financial reporting, and auditing arrangement.

Financial reporting

The PMU will prepare IFRs for the Project in accordance with agreed formats as part of project progress reporting. The IFRs will be used to help monitor and supervise project implementation.

The IFRs will include, but not limited to, the following financial statements: (a) balance sheet of the project; (b) statement of sources and uses of funds by project components; (c) statement of implementation of the Credit Agreement; and (d) statement of designated account for the Credit. The IFRs will be submitted to the Bank within 45 days after the end of each quarter.

The PMU will agree with the Bank on the content and format of IFRs, which will be designed to accommodate project design and cost structure. The draft IFR formats will be submitted to the Bank for review and comment prior to project effectiveness.

External auditing

The Bank requires that project financial statements be audited in accordance with standards acceptable to the Bank. In-line with other Bank financed projects in Mongolia, the GOM will appoint an independent external auditor, acceptable to the Bank, to conduct annual audit of the project's accounts in accordance with International Standards on Auditing, under terms of reference satisfactory to the Bank. The audit will be financed from the credit proceeds. The auditor will: (a) express an opinion on the annual financial statements; (b) determine whether the DA has been correctly accounted for and used in accordance with the financing agreement; and (c) determine the adequacy of supporting documents and controls surrounding the use of Statement of Expenditures (SOEs) as a basis for disbursement. The auditors will also furnish a separate Management Letter, which will: (a) identify any material weakness in accounting and internal control as well as asset management; (b) report on the degree of compliance of financial covenants of the financing agreement and project agreement; and (c) communicate matters that have come to the attention of the auditors which might have a significant impact on the implementation of the Program.

The annual audit report of project financial statements will be due to the Bank within six months after the end of each calendar year. This requirement is stipulated in the financing agreement. The responsible agency and timing are summarized as follows:

Audit Reports	Submitted by	Date Due
Project financial statements	PMU	June 30 of each calendar year

Annex H: Letters of Support for AusAID Program

MINISTRY OF NATURE,
ENVIRONMENT AND TOURISM
OF MONGOLIA

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Date 16 December 2011
Ref. 11/5406

TO: MS CORALIE GEVERS
COUNTRY MANAGER
WORLD BANK COUNTRY OFFICE
ULAANBAATAR, MONGOLIA

Subject: World Bank support for Groundwater in Southern Mongolia

Dear Ms. Gevers,

I would like to take this opportunity to express our appreciation to the World Bank for its past and ongoing support for Ministry of Nature, Environment and Tourism of Mongolia. While the ministry is responsible for all nature and environmental issues in the country, an area that has emerged as a priority is the effective management on the groundwater to support mining activities, especially in Southern Mongolia.

I would like to convey my full support and cooperation for proposed groundwater management activities that would be financed through a grant from AusAID. This support will significantly improve the capacity of Ministry of Nature, Environment and Tourism to manage the country's groundwater resources.

I look forward to partnering with the World Bank and AusAID on this urgent matter.

GANSUKH Luimed,
MINISTER

Оюу Толгой

No.8581/3 2011 оны 12 сарын 19 өдөр

Mr. Jim Reichert
Sr. Infrastructure Specialist
World Bank Country Office
Ulaanbaatar, Mongolia

Subject: Support for World Bank Initiative to Strengthen Groundwater Management in Southern Mongolia

Mr. Reichert,

The purpose of this letter is to express our support for the World Bank's efforts to improve the management of groundwater in the South Gobi Region of Mongolia.

As you are aware, the availability of groundwater is of critical importance to the long-term development of the Oyu Tolgoi (OT) mine. Our research indicates that groundwater is a non-renewable resource in this part of Mongolia and as such, must be carefully managed. At our mine site, OT has instituted measures to minimize water consumption and recycle as much water, as possible.

Strengthening the institutional structure to manage groundwater in a sustainable manner is in everyone's interest. We welcome the World Bank's efforts to improve cooperation and government coordination to manage this important resource and enthusiastically express our support for this important initiative.

Regards,

Matthew Gili
Chief Operating Officer
Oyu Tolgoi LLC

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References

ADB, "Factsheet", 2010

AusAID, "An Effective Aid Program for Australia: Making a real difference—Delivering real results", 2011a

AusAID, "Design Summary and Implementation Document-World Bank Water and Sanitation in India", (Sample DSID) 2011d

AusAID, "Integrating Environment into Aid Activity Design, Nov 2011b

AusAID, "Integrating Gender Equality into Aid Activity Design, Mar 2011c

AusAID, "Project Design Document for Supporting Reforms in Urban and Rural Water Supply and Sanitation", Water and Sanitation Initiative for India,(Sample PDD report), April 2011e

AusAID, "QAE template", June 2011g

AusAID, "The Australian Government's Aid Program to Mongolia: An Overview", July 2011f

AusAID, "Typical structure and content of a Design Document", June 2011h

AusAID, Environmental Management Guide for Australia's Aid Program, Coomonwealth of Australia, 2003a

AusAID, Summary - Environmental Management in AusAID, 2003b

Bayarmaa Tsererendavaa (editor), "Compendium of laws: a Mongolian Citizens Reference Book", The Asian Foundation Mongolia, 2008

Burchi S, "Linking ancestral and customary rights with formal law", PPP in Spanish, FAO, Guatemala, May 2011

Castañeda, MP, "Feminist Methodology", PPP in Spanish, March2009

Cisneros B J (Blanca Jiménez-Cisneros) "Safe Sanitation in Low Economic Development Areas", in Wilderer, P. et al., editors, *Tratise on Water Science*vol. 4, pp. 147–201 Oxford: Academic Press. Elsevier, Ltd, 2011

Communication Initiative Network 2009, Where communication and media are central to social and economic development, http://www.comminit.com

Cooper E et al Editors, "The Wealth of the Poor: managing ecosystems to fight poverty", UNDP, UNEP, WB, World Resources Institute, 2005

Crrok, J, Mosher J & Casteline M, "Status and Role of Water Reuse: an International View", prepared for Global Water Research Coalition, Pre-publication copy, March 5 2005.

Dennis P. Sheehy Cody M. Sheehy, D. Bayartsogt, D. Daalkhaijav, "Development and Change in the South Gobi Region of Mongolia (Livestock Related Issues)", Discussion Note commissioned by The Netherlands–Mongolia Trust Fund for Environmental Reform as part of the South Gobi Regional Environmental Assessment, Draft June 2008 *

Foster S & Loucks DP Editors, Stephan R, Aureli A & Kemper K Coordinators, "Non-Renewable Groundwater Resources - A guidebook on socially-sustainable management for water-policy makers", IHP-VI, series on Groundwater no. 10, UNESCO, IAH, GW-MATE, World Bank, 2006

Funes S 2010, “Comunicación para el Desarrollo Hídrico en Ceará, Brasil” (In Spanish: Communication for Water Resources Development in Ceará, Brasil), Mission Report for the World Bank.

Garduño H and Foster S, "Support to Groundwater Management in North China", WB/GW-MATE Project No. 121942, Final Mission Report, September 15, 2010 *

Garduño H 2010, "Framework and Development Plan for a Groundwater Management Center for Southern Gobi, Mongolia - Comments and Recommendations on Final Report, December 2010

Garduño H and Foster S, "Support to Groundwater Management in North China", WB/GW-MATE Project No. 121942, Preliminary Mission Report, June 5, 2010 *

Garduño H and Yuquan X, "Chinese Legislation and Institutional Framework for Groundwater Management", 2003 *

GOM, "ACTION PLAN TO IMPLEMENT WATER NATIONAL PROGRAMME", 2010 *

GOM, "Approval of the Water National Program", 20 May
2010 *

GOM, "Ministerial Resolution 114 About the Nuhurluls – group of local citizens, participating in protecting, using owning of the some part of natural resources.", 2007 *

GOM, "Resolution on Approval of the Action Plan of the Government for 2008-2012", 21 November 2008

GOM, "The Constitution of Mongolia", 12 February 1992 *

GW-MATE BN- 6, 2002-2006. "STAKEHOLDER PARTICIPATION IN GROUNDWATER MANAGEMENT - enabling and nurturing engagement", The World Bank, GWP, WPP, BNWPP & DFID

GW-MATE BN-10, 2002-2006. "GROUNDWATER DIMENSIONS OF NATIONAL WATER RESOURCE PLANNING AND RIVER BASON PLANNING – promoting an integrated strategy", The World Bank, GWP, WPP, BNWPP & DFID

GW-MATE BN-16, 2002-2006. "GROUNDWATER DEPENDENT ECOSYSTEMS - the challenge of balanced assessment and adequate conservation", The World Bank, GWP, WPP, BNWPP & DFID

GW-MATE BN-7 2002-2006. "ECONOMIC INSTRUMENTS FOR GROUNDWATER MANAGEMENT – using incentives to improve sustainability", The World Bank, GWP, WPP, BNWPP & DFID *

GW-MATE BN-8, 2002-2006. "GROUNDWATER QUALITY PROTECTION - defining strategy and setting priorities", The World Bank, GWP, WPP, BNWPP & DFID

GW-MATE GROUNDWATER QUALITY PROTECTION - a guide for water utilities, municipal authorities, and environmental agencies., The World Bank, GWP, WPP, BNWPP & DFID

GW-MATE SO-1, 2010. "GROUNDWATER GOVERNANCE: conceptual framework for assessment of provisions and needs", The World Bank, GWP, BNWPP & DFID

http://faolex.fao.org/faolex/index.htm

http://water.worldbank.org/water/related-topics/groundwater-management-advisory-team

Jaspers F, Tsetsege & Erdenebayer, "Strengthening IWRM in Mongolia - Water Authority's Legal Arrangements", MNET, May 2009a *

Jaspers F, Tsetsege & Erdenebayer,"Strengthening IWRM in Mongolia - CRB's Legal Arrangements", MNET, October
2009b *

Jiménez B, "Wastewater Risks in the Urban Water Cycle", Chapter 7 in *Urban Water Security: Managing Risks*. Jiménez B. and Rose J. Editors, 324 pp. Taylor and Francis Group, ISBN: 978-0-415-48567-8, 2010

Klugman, J (Director & lead author), "Human Development Report 2011: sustainability and equity - a better future for all", UNDP, 2011

Klugman, J, "A Sourcebook for Poverty Reduction Strategies- Vol1: Core Techniques and Cross-Cutting Issues", World Bank, Washington DC, 2002

Lena Horlemann & Ines Dombrowsky"Institutionalizing IWRM in Developing and Transition Countries – The Case of Mongolia", UFZ, 2010

Livingstone A, Erdenechimeg Ch & Oyubsuvd A, "Needs assessment on institutional capacity for water governance in Mongolia", GOM & UNDP, 2009

Lkhagvadorj A, "Fiscal federalism and decentralization in Mongolia", Universitätsverlag Potsdam, 2010

MoJM, Law of Mongolia in Non-Governmental Organizations, 26 February 1997 *

Owen R, Mirghani M, Diene M, Tuinhof A and Taylor P, 2010, "Groundwater Management in IWRM Training Manual", Cap-Net (UNDP), AGW-net and GW-MATE (World Bank), February 2010 *

P.Batimaa, B.Myagmarjav, N.Batnasan, N.Jadambaa, P.Khishigsuren," Urban Water Vulnerability to Climate Change in Mongolia", MNET, 2011

P.Batimaa, B.Myagmarjav, N.Batnasan, N.Jadambaa, P.Khishigsuren," Urban Water Vulnerability to Climate Change in Mongolia", MNET, Press Release, 2011

Rady Graham 2011 "Quality at Entry Report for Strengthening Water Resource Management in Mongolia"

Reichert J, PAD to Mongolia for a MN-MINING INFRASTRUCTURE INVESTMENT SUPPORT PROJECT April 7, 2011

Sahjeevan, "Water pricing Study", draft report, India, November 2011

SGKM, "Amendments of the Environmental Protection Law of Mongolia", 18 November 2005

SGKM, "Forest Law of Mongolia", 31 March 1995

SGKM, "Law of Mongolia on Land", 7 June 2002

SGKM, "Law of Mongolia on Licensing", 1 February 2001

SGKM, "Law of Mongolia on Minerals", 1 July 1997

SGKM, "Law of Mongolia on Water", 13 April 1995 *

SGKM, "Law of Mongolia on Water", April, 2004

SGKM, "Law on Reinvestment of Natural Resource fees for the Protection of the Environment and the Restoration of Natural Resources", 28 January 2000

SGKM, "Law on Special Protected Areas", 15 November 1994

SGKM, "Law on Subsoil", 29 November 1989 *

SGKM, "Mongolian Law on Buffer Zones", 23 October 1997

SGKM, "Resolution No. 78 about some measures to implement the Land Law", November 1994 *

SGKM, "The Mongolian Law on Water and Mineral Water Fees", May 22 1995

SGKM, Environmental Protection Law of Mongolia", 30 March 1995

Sheehy D, Sheehy C, Johnson D and Damiran D. Livestock and Wildlife Issues in the Context of Development in the Southern
Gobi Region. Mongolia Discussion Papers, East Asia and Pacific Sustainable Development Department. World Bank, Washington, D.C., 2010

South Gobi Resources Ltd (http://www.southgobi.com/s/OvootTolgoi.asp) *

State Great Hural (Parliament) of Mongolia, "Endorsement of the MDGs-bases Comprehensive National Development Strategy of Mongolia, 19 February 2008

Strengthening IWRM in Mongolia Dutch Project, "Regulation of RBC-draft", 26 June 2009 *

Sun-Hee Lee et al 2011 "Peer Review of World Bank Concept Note: World Bank - Strengthening Water Resource Management in Mongolia"

Tuinhof A, "MONGOLIA Framework and Development Plan for a Groundwater Management Center: Draft Terms of Reference", World Bank, May 2010 *

Tuinhof A & Buyanhishing N 2010, "MONGOLIA Groundwater Assessment of the Southern Gobi Region", World Bank, April 2010 *

UNESCO, "Millennia Women Actors 2015 Conference", 2011

Walton T with inputs from Whitten T, Finch O, Schleicher J,Dore G, Sheehy D and Badarch EO."Southern Gobi Regional Environmental Assessment", World Bank, 2010 *

Warlters M, Reichert J, Whitten T, Tsevegmid T, Hancock G, Khaminwa A, Badarch EO, Jamba S, Tuvaan N, Ichinkhorloo B, Yadmaa O, MacDonald D, and Gurjav B."Southern Mongolia Infrastructure Strategy - SMIS", World Bank, 2009 *

WB 2011a "Concept Note for AusAID Financing Strengthening Groundwater Management in Southern Mongolia"

World Bank 2011b, "MONGOLIA QUARTERLY BRIEF" – APRIL 2011 (The full report can be downloaded at http://www.worldbank.org.mn)

World Bank 2011c, "Framework and Development Plan for Strengthening of Groundwater Management of Southern Mongolia" *

World Bank, "Mongolia Mining Sector: managing the future", ____ *