

SECTION C: IMPACT ASSESSMENT

CHAPTER C8: POPULATION AND INFLUX

Contents

8	POPULATION AND INFLUX.....	2
8.1	INTRODUCTION.....	2
8.1.1	<i>Oyu Tolgoi Approach to Worker Housing</i>	3
8.2	SCOPE.....	4
8.2.1	<i>Spatial Scope</i>	4
8.2.2	<i>Temporal Scope</i>	5
8.3	INFLUX ASSESSMENT.....	6
8.3.1	<i>Summary of Impacts</i>	6
8.3.2	<i>Influx to the Region and Intra-Regional Population Movements</i>	6
8.3.3	<i>Influx into the Project Area of Influence</i>	12
8.3.4	<i>Uncontrolled Artisanal Mining</i>	28
8.4	SUMMARY OF RESIDUAL IMPACTS.....	29

Figures

Figure 8.1:	Oyu Tolgoi Project Area of Influence	5
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Tables

Table 8.1:	Khanbogd Soum Centre Population and Migration.....	2
Table 8.2:	Soum Level Population Projections, Years 2010 to 2020.....	12
Table 8.3:	Oyu Tolgoi Construction Workforce (Average Annual Figures) and Revised Influx Estimates .	13
Table 8.4:	Net Migration to Khanbogd Soum (Excluding Oyu Tolgoi Staff and Contractors)	14
Table 8.5:	Summary of Impacts: Population Influx.....	30

8 POPULATION AND INFLUX

8.1 INTRODUCTION

All Oyu Tolgoi Project components are located within Khanbogd *soum*, an administrative sub-division of Omnogovi *aimag*. Khanbogd *soum* centre (the *soum* capital) is the closest community to the Project, and is located 42-km to the north east of the mine site and connected to Oyu Tolgoi via an unsealed road.¹

During the construction phase, all Project components, including the mine, permanent airport, transport infrastructure corridor, power transmission line, Gunii Holooi borefield and water supply pipeline, are being built using a Mongolian and international workforce peaking at approximately 18,000 personnel on-site (in 2011). The construction workforce are housed in a combination of purpose-built accommodation camps within the Oyu Tolgoi Mine Licence Area in Khanbogd *soum* centre and on the Oyu Tolgoi to Gashuun Sukhait road and Gunii Holooi pipeline alignments.

Towards the end of the construction phase and throughout operations, operational Project personnel will be increasingly housed with their families in Khanbogd, complemented by a range of Fly-In-fly-Out (FIFO) and Bus-In-Bus-Out (BIBO) commuting arrangements.

The original Oyu Tolgoi housing model envisaged dispersed housing with a combination of camps and employee housing at locations across the South Gobi region. This approach was abandoned due to the predicted social issues and problems associated with the prolonged separation of workers from their families and large travel distances involved. A site selection process for the town and business park development is being undertaken in Q2 2012. Considerations include: distance from location to the mine; environmental concerns (weather; biodiversity etc); cultural heritage; land ownership and availability; accessibility to services etc. Options which could support the development of a residential hub within a reasonable commuting distance from the mine, allowing workers to live together with their families (a major factor in relation to retention and sustainability of the workforce) are now being investigated. The *soum* centre is a small settlement with extremely limited infrastructure and a relatively small population in relation to the Oyu Tolgoi workforce demands. The centre had a population of 1,455 in 2001 and the overall permanent *soum* population was 3,522 in 2010. *Soum* population including temporary residents (those present in the *soum* on census day and spending more than 183 days in the *soum* in 2010, (and largely Oyu Tolgoi fly-in-fly-out (FIFO) and bus-in-bus-out (BIBO) employees and contractors) was 7150.²

Influx to Khanbogd *soum* centre over the past few years (including Oyu Tolgoi contractors and staff living within the *soum* centre, but not including workers living in construction camps in the Mine Licence Area and other remote construction camps) is as shown below:

Table 8.1: Khanbogd Soum Centre Population and Migration

Year	<i>soum</i> centre Population	In-migration	Out-migration	Net migration	Percentage increase due to migration
2006	2901	183	33	150	5.2%
2007	2974	126	72	54	1.8%
2008	3022	71	68	3	0.1%
2009	3154	96	50	46	1.5%
2010	3522	305	49	256	7.3%
2011 (to October)	Approx. 3900	323	86	237	7.3% (annualised)

Source: Khanbogd *soum* Governor's Office

All in-migrants to Khanbogd *soum* (as across Mongolia) are required to register with the *soum* administration. This includes permanent and temporary migration from within Mongolia and also national and international contractors. As a result, the table above captures all residents, of whatever nature, within the *soum* centre.

¹ Oyu Tolgoi maintains and improves this road to facilitate movements between Khanbogd *soum* centre and the mine site.

² National Statistics Office. Population Census 2010.

This Chapter of the ESIA describes the potential impacts associated with population influx into Khanbogd *soum*, includes a summary of influx predictions at the regional and *soum* levels, and describes the measures proposed by Oyu Tolgoi to control and mitigate the impacts associated with influx.

For the purposes of this Chapter, *Influx or population inflow* is defined as the arrival of considerable numbers of migrants from areas other than Khanbogd *soum*, thereby resulting in demographic changes within the host community, such as an increase and altered composition of the population, as well as leading to extra pressure on social infrastructure in the recipient community.

8.1.1 Oyu Tolgoi Approach to Worker Housing

Given the long operational life of the mine it is imperative that the most appropriate site is selected that provides workers with an attractive living environment which minimises commuting times to Oyu Tolgoi, while also supporting the development of a sustainable community in Khanbogd given its likely role as a focal point for influx into the Project Area of Influence.

There are three inter-linked issues that need to be considered in relation to worker housing:

- Oyu Tolgoi's requirements for operational worker housing and a business park and supply area;
- Influx into the *soum* will be affected by the decisions made by Oyu Tolgoi on the location of worker housing and the industrial estate; and
- Oyu Tolgoi's approach to regional development support and planning will need to balance the operational requirements for worker housing and service and supply, the impacts of its location decisions on local development, and the obligations of Oyu Tolgoi to support regional development.

Oyu Tolgoi has been progressively moving towards a decision on its operational model and how the issues of employee housing and supplier location will be handled. The option of a model based on predominantly FIFO arrangements has been superseded by one which considers a balance between some FIFO, and predominantly local (Khanbogd-based) family housing, providing the opportunity for a daily commute to the mine for operational workers.

Oyu Tolgoi recognises that the final siting decision for operational worker housing has the potential to change to dynamics of the anticipated influx of people into Khanbogd *soum* who are looking to benefit from the opportunities created by the presence of the Oyu Tolgoi Project.

Site Selection Process

Oyu Tolgoi is undergoing a detailed site selection process for the development of:

- A residential hub to house its employees within the vicinity of the mine, and its location compared to Khanbogd is yet to be determined; and
- A business park for Oyu Tolgoi suppliers, within Khanbogd *soum*.

Ongoing consultation with the local government will see the development of a sub-regional development planning approach in which Khanbogd *soum* centre, the Oyu Tolgoi worker housing area and the Oyu Tolgoi industrial estate would be developed and managed in a coordinated manner. This would ensure that development benefits are more evenly distributed across Khanbogd *soum*, making influx more controllable and contributing to the sustainable development of Khanbogd *soum* centre, irrespective of final detailed site selection decisions.

Principles to be Adopted by Oyu Tolgoi with Regard to Worker Housing

Oyu Tolgoi recognises that the final siting decisions for operational worker housing and industrial estate have the potential to change to dynamics of the anticipated influx of people into Khanbogd *soum* who are looking to benefit from the opportunities created by the presence of the Oyu Tolgoi Project. Oyu Tolgoi will undertake this process and implement its conclusions in a responsible manner consistent with the Investment Agreement, Rio Tinto standards and international good practice (IFC Performance Standards and EBRD Performance Requirements). These principles and commitments are as follows:

- Whatever decision is made by Oyu Tolgoi, Oyu Tolgoi is committed to:
 - Minimising and managing, to the extent possible by its actions, uncontrolled and unplanned population influx to Khanbogd *soum*;

- Minimising environmental and social impacts;
 - Supporting infrastructure development in Khanbogd;
 - Providing targeted assistance to vulnerable groups; and
 - Consulting with local stakeholders and government.
- Oyu Tolgoi is committed to:
 - Undertaking all necessary assessments and studies needed for Mongolian approvals;
 - Undertaking a supplemental ESIA to meet all Lender requirements;
 - Ensuring that sustainable water resources are available to support the projected Khanbogd population and that these would not conflict with existing supplies for herders and wildlife;
 - Ensuring that the residential estate and industrial estate would not adversely impact sensitive ecosystems; and
 - Ensuring that siting decisions would minimise adverse impacts and access to pastureland for herders.

Oyu Tolgoi is committed to honouring its responsibilities to support regional development as set out under the Investment Agreement.

Further information on worker housing and the timetable associated with this issue is provided in *Chapter D16: Influx Management Plan*.

8.2 SCOPE

8.2.1 Spatial Scope

Within the Project Area of Influence, the main areas exposed to influx risk comprise Khanbogd *soum* centre (being the closest town to the mine), and the regional centre – Dalanzadgad – which is likely to attract in-migrants due to its more developed infrastructure and better quality services in comparison to other neighbouring *soums*.³ Other potential destinations for in-migration are locations of the key Project facilities where the main activities related to construction and operation will occur, such as mine site, road corridor, etc. These areas subject to potential population inflow are:

- Outside the fenceline of the Oyu Tolgoi Mine Licence Area;
- The road accessing the mine site from Khanbogd (particularly when it is paved in later years);
- Tsagaan Khad community, which is crossed by the “coal road” between the Tavan Tolgoi coal mines and the Chinese border at Gashuun Sukhait, and where an “influx community” is already established⁴;
- Three temporary worker camps in locations along the Oyu Tolgoi –Gashuun Sukhait road, the water pipeline from the Gunii Hooloi well-field to the Mine Licence Area, and in the well-field itself;
- The Gashuun Sukhait border crossing point between Mongolia and China, which has the potential to develop as a “border town” of its own, if the border crossing is opened 24 hours per day and as trans-boundary traffic and trade flows significantly increase;
- Areas around the proposed Oyu Tolgoi -employee residential hub and related business park; and

³ See *Chapter D14: Stakeholder Engagement Plan* for detailed description of the Oyu Tolgoi Project Area of Influence and its components.

⁴ Tsagaan Khad is located at the junction of the Oyu Tolgoi to Gashuun Sukhait road and the coal transportation route from Tavan Tolgoi to Gashuun Sukhait. The current design of the Oyu Tolgoi to Gashuun Sukhait road bypasses this locality such that the road will not go directly through the informal settlement which has developed along the current route of the road.

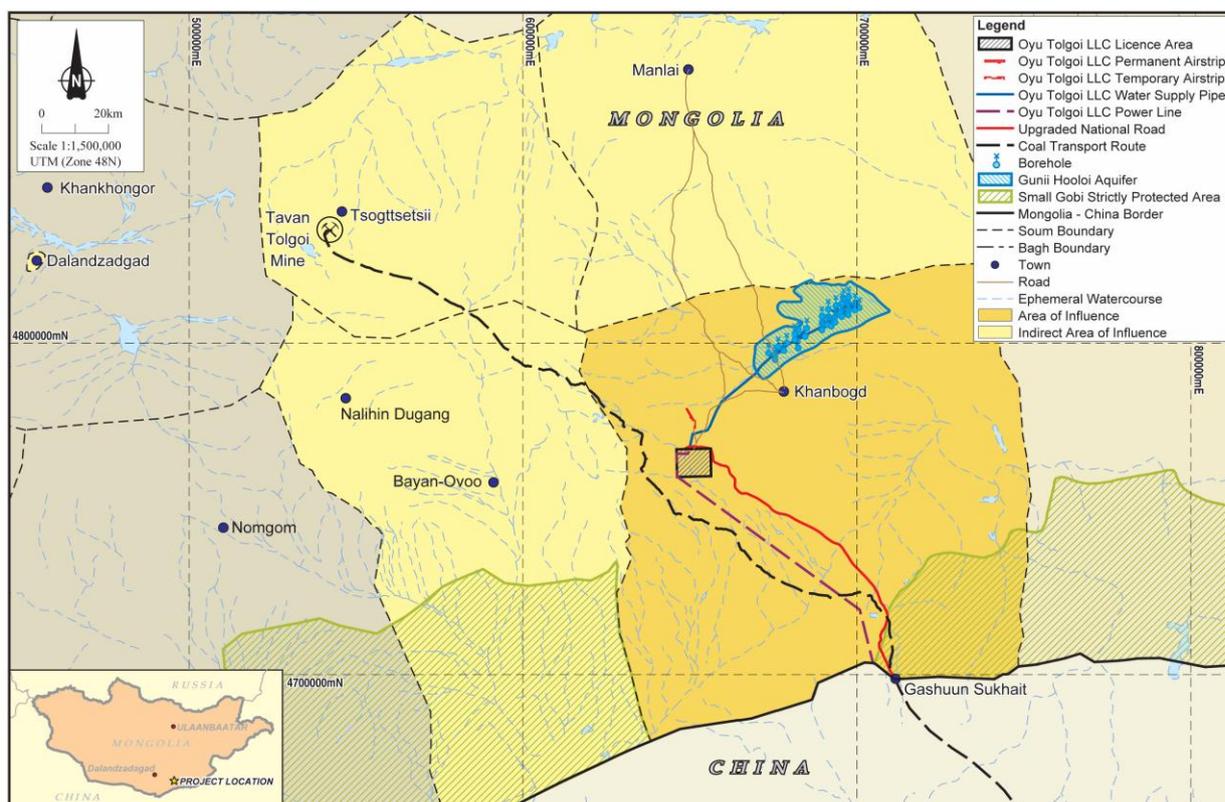
- Dalanzadgad town (the centre of Omnogovi *aimag*), where Oyu Tolgoi operates a Project office and is establishing a number of regional initiatives to support the Project and related businesses, including a supplier development centre and vocational training facilities.

There may also be some influx into other nearby *soums* within the Project Area of Influence, including Bayan Ovoo and Manlai, but this is not considered to be a significant risk at present, since neither of these locations are within daily commuting distance of Oyu Tolgoi, and the levels of service and infrastructure in these *soums* are insufficient and even poorer than those in Khanbogd.

Migrants to Khanbogd and Dalanzadgad, attracted by improved infrastructure and employment opportunities (formal and informal, direct and indirect), will likely occupy vacant and uninhabited spaces within the existing rural and town landscapes. This “infill”⁵ settlement will be accompanied by residential sprawl extending beyond the existing planned town areas and spreading along the transportation routes which traditionally serve as conduits for urbanisation and migrant transfer, if not properly controlled.

Current provisions of the Land Law of Mongolia, particularly an entitlement of every Mongolian citizen to a *khashaa* (land plot) of 700 sq. m, present additional challenges to achieving efficient and regulated urban development in the Project Area of Influence. *Khashaa* plots are being issued at an accelerating rate, and their proliferation poses increasing challenges for urban planners in ensuring efficient centralised developments.

Figure 8.1: Oyu Tolgoi Project Area of Influence



8.2.2 Temporal Scope

The temporal scope of the assessment covers the construction phase, the life of the mine (operations), and post-mine legacy.

However, due to the fact that a final site selection on worker housing and associated planning has yet to be finalised by Oyu Tolgoi, this impact assessment chapter is focused principally on the construction phase.

⁵ Filling in the existing spatial gaps.

A supplemental ESIA will be prepared by Oyu Tolgoi as part of the site selection and planning process for Oyu Tolgoi worker housing, the business park area and applicable activities and infrastructure either being developed or proposed to be developed by Oyu Tolgoi that are related to the development of Khanbogd *soum* centre.

The supplemental ESIA will address fully operational and mine closure issues. While many of the key issues are mentioned in this chapter, a full and more detailed assessment has not been provided as many of the key decisions with regard to worker housing (and hence influx) have yet to be made by Oyu Tolgoi.

8.3 INFLUX ASSESSMENT

8.3.1 Summary of Impacts

The influx of migrant population into the Project Area of Influence as a result of Oyu Tolgoi's operations and related activities will lead to the following main impacts:

- Increased pressures on natural resources, such as pastureland and water supplies;
- Increased population levels and associated demands on pastureland and water, leading to environmental degradation and pressures on biodiversity;
- Intensifying population movements within the South Gobi region, with associated risks of cultural conflict and increased prevalence of communicable diseases;
- Impacts on the use and provision of utilities and services within the Project Area of Influence, and predominantly in Khanbogd *soum*, including:
 - Increased load on infrastructure and public services (power and energy; drinking water supply; waste water and solid waste collection and treatment); and
 - Increased pressure on education and health care services and facilities.
- Increased pressure on personal safety and well-being as a result of increased crime and other stresses related to modern urban lifestyles;
- Inflationary pressures as increased income levels and economic activity, create upward pressure on prices for goods and services;
- Increased pressures on traditional herder lifestyles as the growing cash-based economy displaces traditional economic activities;
- Potential gender imbalance as disproportionate numbers of young single male workers are employed by Oyu Tolgoi, creating the potential for increased law and order issues related to alcohol, prostitution and sexual assault; and
- Recurrence of unregulated artisanal mining activities.

Positive impacts related to employment opportunities and economic developments are addressed in *Chapter C9: Employment* and *Chapter C7: Economics* and are not discussed in detail in this chapter.

The principal mitigation measures for the 'collective' impacts described above will be through the development and implementation of a regional development strategy for the mine impacted areas within the Project Area of Influence.

The remainder of the Chapter discusses both regional and local (Project Area of Influence) impacts stemming from the population influx, together with associated mitigation actions and initiatives. A summary table of residual impacts following the application of mitigation measures is provided at the end of this Chapter (see Table 8.5).

8.3.2 Influx to the Region and Intra-Regional Population Movements

This section describes influx trends and population dynamics on the regional (*aimag*) level and particularly in Dalanzadgad, the *aimag* centre.

Description of the Impact

Influx to the Aimag Capital: Dalanzadgad

While the majority of Oyu Tolgoi and Tavan Tolgoi construction materials and equipment will be procured from China, Dalanzadgad – the capital of Omnogovi *aimag*, is likely to emerge as the Mongolian service centre for the two mines as well as other mining projects that are currently in various stages of exploration and feasibility investigation, e.g. to the west of Dalanzadgad around Gurvan Tes.⁶

The attractiveness of Dalanzadgad to potential in-migrants consists in its superior infrastructure and housing stock as compared with the other *soums*, as well as better quality business and living environments.

The 2007 *Influx Risk Assessment* predicted an increase in the range of 10% of the population of Dalanzadgad, resulting from in-migration engendered by employment opportunities related to construction.⁷ This influx is likely to be further increased, as Oyu Tolgoi training facilities (Vocational Training School) will be located in Dalanzadgad (see *Chapter C9: Employment* for further details on Oyu Tolgoi vocational training). However, recent data from *aimag* authorities indicate that the population of Dalanzadgad has already reached nearly 19,000 in 2010⁸, compared to 17,000 in 2007. This population rise has resulted not solely from the natural increase of the population, but also from in-migration which has emerged as a major contributing factor. The population of Dalanzadgad grew at the rate of 12.4% in 2009.

Additional functions that will be catered for in Dalanzadgad and will represent the points of attraction for migration also include:

- A logistical hub for concentration of mines-related goods and services sourced from elsewhere in Mongolia;
- Mines workforce housing base (for some of the workers commuting based on a bus-in/bus-out roster model); and
- An education and training centre.

Such activities are likely to contribute to a steady ongoing growth of the population.

While Dalanzadgad is likely to be a focus for regional influx, it is considerably better equipped and developed to absorb such influx than any of the rural *soums* in the Project Area of Influence. This greater degree of resilience results from the following:

- The scale of construction-related influx (through Oyu Tolgoi workforce demands) into Dalanzadgad in relation to the size of the host population is likely to be not as significant as for the other *soums* where the population is much smaller;
- Dalanzadgad has a larger and more skilled resident workforce, many of whom may be well positioned to gain employment with Oyu Tolgoi and other mining projects both during construction and operations. This will lead to increased incomes contributing to the strengthening of Dalanzadgad economy;
- As the *aimag* (province's) capital, Dalanzadgad has significantly greater government capacity, budgetary resources, and higher capability to leverage additional resources from the central government if required;
- As compared with the other *soums* in the Project Area of Influence, Dalanzadgad has relatively better established infrastructure, both in terms of utilities and social services;
- There is a larger supply of and better quality housing stock in Dalanzadgad (i.e. more permanent housing and apartments), together with the availability of private construction contractors capable of responding to increased housing demand; and

⁶ Gurvan Tes is one of the *soums* of Ömnögovi *aimag*. Nariin Sukhait Coal Mine is located 25 km south-east from the *soum* centre.

⁷ Barclay and Associates 2007. Oyu Tolgoi: Influx Risk Assessment. Background report prepared for Ivanhoe Mines Mongolia, Inc., and Rio Tinto.

⁸ Census data 2010, National Statistics Office of Mongolia.

- Well-established commercial enterprises that can also cater for a range of needs of the growing population.

A buoyant economy, higher standard of living and more favourable business environment in Dalanzadgad may potentially accelerate an intra-regional shift of population from other *soums* in the Project Area of Influence to Dalanzadgad. On the other hand, this trend may be balanced through the growth of Khanbogd and Tsogttsetsii *soums* as a result of the mines' operations (Oyu Tolgoi and Tavan Tolgoi, respectively) and improved economic performance due to mining related income and investment, which may in turn lead to these centres of mining emerging as new commercial hubs of South Gobi region.

A potential area of concern related to the population inflow in Dalanzadgad is the probable concentration of influx formations in mobile *ger*⁹ enclaves on the outskirts and on the periphery of the town, coupled with inadequate sanitation, the lack of other basic services and safety/security provisions, as well as propagation of various adverse social phenomena (such as poverty, alcohol and substance abuse, illicit trade and commercial sex activities). These aspects will need to be closely monitored and promptly addressed if arisen, in close collaboration with government's applicable regulatory bodies.

Influx to other soum Centres – Bayan-Ovoo and Manlai

In the other two neighbouring *soums* in the Project Area of Influence – Bayan-Ovoo and Manlai – which are adjacent to Khanbogd, a two-directional movement of population has been observed, namely out-migration to Khanbogd and Tsogttsetsii for mine-related jobs and other associated economic opportunities, and in-migration from more distant and less well-off locations in search of employment.

A recent common trend in Khanbogd *soum* and its neighbouring *soums* – Dalanzadgad, Bayan-Ovoo and Manlai – has been the consolidation of the population predominantly in the *soum* centres, as herder families increasingly move into the urban areas from pasturelands. Factors contributing to this trend are as follows:

- Loss or degradation of grazing land, also as a result of industrial interventions;
- The *dzud*¹⁰ and modification of herder livelihoods related to mining developments, climatic and other issues; and
- The slow recovery of markets for animal products after the global financial crisis and repeated poor growing seasons and natural adverse phenomena.

Influx to Tsogttsetsii

These factors have intensified attempts by herders whose livelihoods are natural resource-dependent to seek alternative employment, including with Oyu Tolgoi and other industrial projects such as the coking coal factory in Bayan-Ovoo and the coal projects in Tsogttsetsii. Tsogttsetsii *soum* has recently witnessed a dramatic increase in population as a result of influx associated with the Ukhaa Khudag coal mine operated by Energy Resources LLC and Tavan Tolgoi coking coal deposit. Given the 120-km distance from Oyu Tolgoi to Tsogttsetsii, it is not expected that influx settlements occurring there will have a direct impact on the Oyu Tolgoi Project Area of Influence and Khanbogd *soum*.

The influx associated with Oyu Tolgoi and other mining activities in the *aimag* (in particular Tavan Tolgoi¹¹) is expected to double the *aimag* urban population in the next ten years on the basis of the current resident population and calculated employment needs.

⁹ *Ger* is a portable felt-type assembled dwelling that is traditional in Mongolia.

¹⁰ '*Dzud*' - Mongolian word for 'white death' denotes extremely harsh winter with very low temperatures exacerbated by heavy winter snow and strong arctic winds. Such winters are typically preceded by a summer drought and are followed by a dangerous spring thaw, which makes *dzud* a multiple and complex natural hazard. As a result of the 2009-2010 *dzud* and by the end of April 2010, reportedly more than 7.8 million head of livestock (some 17% of all Mongolia's livestock) had perished nation-wide. See also: *Humanitarian Appeal, Mongolia 2010 - Dzud Appeal*, United Nations Office for the Coordination of Humanitarian Affairs.

<http://ochaonline.un.org/humanitarianappeal/webpage.asp?Page=1856>

¹¹ The biggest coal deposit in Mongolia, and is one of the 10 biggest deposits in the world. Tavan Tolgoi JSC exported 1 million tons of coal in 2007. Source: <http://tavantolgoi.mn/>

Mitigation Measures

Local Regional Planning and Infrastructure (LRPI)

Oyu Tolgoi recognises that the Project has an obligation to support both regional and local governments to implement a joint and coordinated response to influx and associated impacts. This type of support will be provided through Oyu Tolgoi's **Local Regional Planning and Infrastructure (LRPI) unit** to coordinate with the Southern Gobi Regional Development Council (SGRDC) that has been established by the Mongolian Government as per the terms of the Oyu Tolgoi Investment Agreement. A primary goal of the Oyu Tolgoi LRPI initiative is to ensure balanced and sustainable regional planning and associated public infrastructure within the Project Area of Influence, in partnership with national and local governments.

Initiatives already under implementation under the LRPI programme include the following:

- Development of a local groundwater resource and provision of bulk water supply infrastructure to provide a permanent potable water supply to Khanbogd *soum* centre;
- Construction of a 35 KV transmission line from Oyu Tolgoi site to Khanbogd *soum* centre to provide a long-term permanent source of power;
- Monumenting of rights of way and provision of a constructed macadam road network with Khanbogd *soum* centre;
- Construction of a vocational training institution in Dalanzadgad; and
- Extensions to the Khanbogd *soum* centre school and kindergarten to increase the pupil capacity.

Participation in Southern Gobi Regional Development Council

Section Four of the Oyu Tolgoi Investment Agreement (IA) specifies that the Government of Mongolia will establish the "Southern Gobi Regional Development Council" (the "Council") and shall support its activities. It further proposes that the Council will be governed by a board, which shall include representatives of the Government, local governance organisations, private sector entities, civil society organisations as well as donor and international finance institutions whose activities orientate to the South Gobi region. The IA prescribes that the Investor (Oyu Tolgoi) will be a member of the Council's governing board, and will support the Council and its activities. The Council, in turn, will assist the Government in the following areas in terms of preparation, financing, organising and implementation of the Southern Gobi local and regional development strategy, plans and budgets:

- Coordination of in-migration influx;
- Support to local and regional development and encouraging transparent and responsible governance;
- Resolving matters of urban planning and development, including power, roads, water supply, heating and sewerage;
- Organisation of formal and non-formal education, including English language and vocational training;
- Focus on human health care, construction of diagnostic centres, cultural facilities, sports facilities, improvement of veterinary services; and
- Support to capacity building for local governments and civil society.

In addition to the above, the Agreement states that the Investor will support socio-economic development policies and activities undertaken by Southern Gobi local administration and will develop partnerships to ensure that sustainable benefits from the Oyu Tolgoi Project reach Mongolian people, including people in Omnogovi *aimag*.

The direction of Oyu Tolgoi's regional activities are fully governed by the aforementioned framework, and will be designed and implemented in close coordination and consultation with regional and local government bodies, the public and other relevant stakeholders, so that a general consensus is built on the development priorities and effective strategic partnerships are formed to facilitate the realisation of plans.

Regional Development Programme and Coordination with Other Initiatives in South Gobi

Oyu Tolgoi has drafted a **Regional Development Programme** to address the weaknesses in regional infrastructure and the associated development issues posed and faced by the Project.

In the design and implementation of its Regional Development Programme, Oyu Tolgoi is guided at a macro level by the Millennium Development Goals (MDGs)¹². The Programme will focus on joint actions by Oyu Tolgoi with national, *aimag* and local governments to develop the infrastructure of the *soums* in the Project Area of Influence and to address the development priorities, particularly through working with the Southern Gobi Regional Development Council, in which Oyu Tolgoi is represented. Oyu Tolgoi will be encouraging the national Government to spend a significant proportion of the national revenues from Oyu Tolgoi on investments in developing infrastructure of the *soums* that fall within the Project Area of Influence. (See *Chapter C7: Economic Impacts* for further details on revenues to the state budget as a result of the Project)

The Oyu Tolgoi *Regional Development Programme* is centred on Khanbogd *soum* and the surrounding *soums* within Omnogovi *aimag* and will contribute positively to the sustainable development of Khanbogd and its sub-region through encouraging:

- The creation of acceptable employee housing;
- The development of a business park in Khanbogd; and
- Local outsourcing.

The Project's strategy for regional development also includes the following:

- In collaboration with the Mongolian Government and other development partners and donors, Oyu Tolgoi will actively participate in the planning and development of Khanbogd and its sub-region;
- Oyu Tolgoi will assist in the development of Khanbogd as a sub-regional centre through a combination of direct corporate investment and facilitation of investment from both public and private enterprise; and
- Oyu Tolgoi's support to urban and sub-regional development will be closely aligned with both Government and community planning approaches, and will be planning-based and infrastructure-orientated.

As part of implementing its regional development strategy, the Project will carry out the following immediate actions to support the fulfilment of strategic objectives:

- Engagement with internal and external stakeholders to build consensus and understanding, and formation of a Regional Development and Housing Working Group;
- Investigating and determining possible housing incentive scheme options and scenarios; and
- Development of a costed roadmap and Action Plan for Oyu Tolgoi's support to regional development, including possible financing for all elements of social infrastructure and the analysis of options for strategic partnerships and investments. This will be reflected in the Cooperation Agreement (which will be a public document) currently under preparation between Oyu Tolgoi and the *soums* within the Project Area of Influence.

The Asian Development Bank (ADB) has approved funding together with the Government of Mongolia of US\$21.9 million in support of the Regional Development Programme. Approximately \$15 million is provided as a grant by ADB to the *aimag* and *soum* administrations with the remaining funds coming from the Government of Mongolia (\$6.8 million) and the *aimag* government (\$0.1 million)¹³. ADB support will

¹²The Goals are centred on the eradication of poverty, achieving universal education, gender equality and women's empowerment, improving maternal health, and ensuring environmental sustainability. See the United Nations dedicated web-site for MDGs: <http://www.un.org/millenniumgoals/>, and United Nations Development Programme in Mongolia: <http://www.undp.mn/mdg.html>

¹³ Asian Development Bank. *Southeast Gobi Urban and Border Town Development Project*. Source URL: <http://www.adb.org/projects/project.asp?id=42184>

be focused on *soum* centres within the South and East Gobi¹⁴, implementation of this programme commenced in 2011. One of the *soum* centres that will benefit will be Khanbogd where support will focus on two key areas:

- Institutional and capacity development;
- Reform of infrastructure services, including shift to performance-based contracts for urban services delivery;
- Institutional development and capacity building to strengthen urban planning and policy making;
- Strengthening of regional cooperation for urban development;
- Cross-border cooperation with China;
- Priority infrastructure improvements;
- Water source development, transmission, storage and distribution, allowing increased connections to piped water supply and reducing system leakage;
- Increased wastewater collection coverage and enhanced capacity for wastewater treatment and effluent reuse;
- Improved efficiency and coverage of district heating services;
- Extended power distribution, particularly to *ger* areas;
- Surfaced central road networks;
- Development of controlled solid waste landfills and enhanced capacity for solid waste collection; and
- Improved stormwater drainage.

The ADB-supported Regional Development Programme (in addition to regional development activities sponsored by Oyu Tolgoi) has commenced implementation in 2011, and for Khanbogd, the programme activities are coordinated with those of Oyu Tolgoi. The ADB-supported programme builds on recent shifts in Government policy to lay a foundation for private sector participation and greater accountability for performance. This will make use of provisions under the Mongolian Law on Concessions, which was passed in February 2010 and sets out a legal basis for public private partnerships (PPPs). To further this agenda, the Government has established a PPP unit to support transactions, and legislation that is being drafted on the provision and regulation of municipal services. Oyu Tolgoi's urban and regional development support aims to be aligned with Government and ADB's activities in the sector.

Oyu Tolgoi is also supporting development and planning activities in Dalanzadgad through a range of initiatives including:

- Provision of capacity building and technical support to local government planning authorities in the *aimag* capital;
- The identification of potential new water resources for future exploration and development to supply the future water demands of the *aimag* capital;
- Provision of technical assistance and equipment to support solid waste management;
- Construction of a new sports and cultural complex; and
- Construction of a Vocational Training Centre.

In addition, Oyu Tolgoi is in the process of agreeing the scope of a Cooperation Agreement with Omnogovi *Aimag* and the four impacted *soums* to cover development planning and infrastructure development support.

Impact Significance

Impacts associated with intra-regional migration due to the Oyu Tolgoi Project are expected to be **moderate adverse** based on restricted extent, **certainty of** occurrence, and **medium-term** duration; intra-regional migration impacts will continue through the construction stage and during mine operations.

¹⁴ Dalanzadgad, Khanbogd, Tsogttetsii, Gurvan Tes in South Gobi and Zamyn Uud and Saynshand in East Gobi.

Implementation of Oyu Tolgoi's Regional Development Programme and other initiatives by the Oyu Tolgoi CSP Department and Regional Development Department (Local Regional Planning and Infrastructure (LRPI) unit), along with the Project's contribution to the activities of the Southern Gobi Regional Development Council, will allow the overall significance of this impact to be reduced to **minor adverse**.

8.3.3 Influx into the Project Area of Influence

This section considers the current projections of population inflow into the Oyu Tolgoi Project Area of Influence and specifically Khanbogd *soum*, and discusses a range of impacts resulting from the influx.

Influx Forecast

Oyu Tolgoi has produced population projection estimates at *soum* level, as shown in *Table 8.2*. These calculations used the same methodology as adopted by the ADB in its population projections for the South East Gobi¹⁵ but draw on slightly different assumptions based on more recent data. The latter included the higher rates of influx observed for Dalanzadgad (exceeding ADB's initial estimates and as described in the preceding section); and the expectation of spin-off development trends in Khanbogd that will be triggered by the Oyu Tolgoi Project, such as new property development, supply sector and service-based businesses. The figures presented in the table below highlight the predicted substantial increase in the size of Khanbogd *soum* population.

Table 8.2: Soum Level Population Projections, Years 2010 to 2020

soum centre	Likely Future Function (and distance from Oyu Tolgoi)	Official Population, Census 2010 (actual levels)	Population Projections (forecast levels)	
			2015	2020
Dalanzadgad	Regional Mining Centre (250 km)	18,746	22,600	30,000
Khanbogd	Key Urban Service Centre for Oyu Tolgoi (45 km)	3,522	14,000	20,000
Manlai	Satellite Urban Centre (120 km)	2,441	2,400	3,000
Bayan Ovoo	Satellite Urban Centre (80 km)	1,600	1,800	2,200

Source: Oyu Tolgoi Regional Development Team 2010, and Khanbogd Government Office 2010.

Khanbogd *soum* has already demonstrated the highest growth rate as compared with the neighbouring *soums* (with the exception of Tsogttetsii).¹⁶ Between 2000 and 2009, Khanbogd experienced a population growth rate of about 4.2% per year which was higher than the national average and was to an extent attributable to the Oyu Tolgoi earlier construction activities. In 2010, the annual rate of census-based population growth exceeded 11% which testifies to the fact that Khanbogd *soum* progressively becomes a locus of increasing migration, primarily as a result of the burgeoning mining industry (see *Chapter B8: Population and Demographics* for more data on the demography of Khanbogd *soum*).

According to the ADB projections, population of Khanbogd *soum* is expected to increase significantly by year 2020 (from 3,522 measured in the 2010 census, to 14,000 in 2015 to 20,000 in 2020)¹⁷.

¹⁵ Asian Development Bank. *Southeast Gobi Urban and Border Town Development Project*. Source URL: <http://www.adb.org/projects/project.asp?id=42184>

¹⁶ Oyu Tolgoi Project Social, Economic and Environmental Subset, centre for Policy Research, Population Training and Research centre, 2009.

¹⁷ Southeast Gobi Urban and Border Town Development Project; PPTA Project Report; Supplementary Appendix A; Asian Development Bank, November 2009.

After the influx assessment for Oyu Tolgoi was completed in 2007¹⁸, the Project on-site construction workforce figures have been revised due to changes in the Project configuration. The following table updates the influx projections previously prepared based on the same methodology.

Table 8.3: Oyu Tolgoi Construction Workforce (Average Annual Figures) and Revised Influx Estimates

Year	Number of Oyu Tolgoi Workers and Contractors			Estimated Influx (Number of in-migrants)	
	Mongolian	Foreign	Total	High (1.0 multiplier)	Low (0.3 multiplier)
2009	1,009	170	1,179	1,009	303
2010	4,331	1,634	5,964	4,331	1,299
2011	7,426	5,477	12,903	7,426	2,228
2012	6,184	3,844	10,028	6,184	1,855
2013	3,533	561	4,094	3,533	1,060
2014	2,903	477	3,380	2,903	871

Source: Oyu Tolgoi Workforce Database

Numbers are shown for foreign workers for completeness, although the presence of the Chinese construction workforce is not anticipated to be a driver of in-migration. Chinese workers live, and will continue to live, within a dedicated autonomous full-service camp located at the Oyu Tolgoi main site and at satellite camps on the Oyu Tolgoi to Chinese border road, and on raw water pipeline alignments. The Chinese workers will be mobilised and de-mobilised in China. Their local spending and ability to interact with local communities is effectively zero, with the exception of being able to shop at the supermarket within the Oyu Tolgoi Mine Licence Area.

Estimates of population influx attributable to the Oyu Tolgoi construction phase activities are summarised in the two right-hand columns in Table 8.3 above. Estimates of influx are derived by applying a simple multiplier to the total number of Mongolian workers on the Oyu Tolgoi site in any given year. High estimates are based on a multiplier of 1.0 and low estimates on the 0.3 multiplier.

Within the Mongolian context, these multipliers are to an extent conjectural given the unprecedentedly large scale of Oyu Tolgoi Project and therefore the absence of extensive accumulated data based on a previous experience. As of December 2006, the sum of registered in-migrant arrivals (less departures) for the previous 3 years (assumed to be Oyu Tolgoi-related) in Khanbogd *soum* was 300. The corresponding workforce at Oyu Tolgoi was about 1,200 in total. On this limited observation, in-migration was equivalent to about 0.25 x the Oyu Tolgoi workforce. Between December 2009 and June 2011, while the total construction workforce increased from 867 to about 14,000, the total registered influx to Khanbogd *soum* centre was about 200, and there is little indication of significant unregistered influx over this period. However, this situation is a reflection of the very careful management of influx which has been exercised by the Project to date; a situation which will change as the mine becomes operational. In other parts of the world, e.g. in Africa or Indonesia, much higher multipliers are commonly used in practice to estimate a construction phase influx, such as multipliers of 3 or 4. These nations are far more populous and have much higher population densities than Mongolia. Those countries also have a legacy of large mining projects with numerous workforces and associated mobile groups of people experienced in providing a range of labour and other services to meet construction camp needs (also known as ‘camp followers’ who may form organised itinerant groups that migrate from project to project). Construction camps are often established with the reliance on catering, laundry and other services provided by those experienced “camp followers”.

Mongolia’s small and dispersed domestic population, the absence of an established practice of camp followers, and the fact that Oyu Tolgoi is being constructed with a relatively limited domestic workforce points to a probability of less dramatic influx than is typically experienced in these larger countries. Although smaller construction phase multipliers may be appropriate within the Mongolian context given

¹⁸ Barclay and Associates 2007. Oyu Tolgoi: Influx Risk Assessment. Background report prepared for Ivanhoe Mines Mongolia, Inc., and Rio Tinto.

the above-mentioned reasons, the actual influx will nevertheless be subject to regular monitoring accompanied by a review of appropriate response measures.

Key assumptions used for the Oyu Tolgoi construction phase influx estimates are as follows:

- The majority of construction phase influx will consist of single people, not migrant families - based on the observations of influx patterns that have occurred to date;
- Construction phase in-migration numbers are expected to be in a direct correlation with the size of the Oyu Tolgoi construction workforce – the larger the workforce, the more sizeable the potential inflow of migrants;
- Fluctuation of the construction phase migration may be sensitive to mobilisation and demobilisation of workers on the Oyu Tolgoi site, i.e. in-migrant arrivals will increase during periods of recruitment and hiring, likely followed by out-migration during periods of down manning and demobilisation;
- A certain percentage of in-migrants arriving during the construction phase will settle in the area and will become permanent residents;
- It is assumed that South Gobi roads will undergo some incremental improvement during the 2010-2012 period, but development of national trunk highway linkages in the Project vicinity is not expected, e.g. there will not be a national highway linking Oyu Tolgoi to Ulaanbaatar¹⁹; and
- The multipliers used to estimate the in-migrant population are assumed to capture all employees that may move into the Oyu Tolgoi Direct Project Area of Influence as part of off-site contractor and service groups, e.g. the Toyota servicing group, housing contractors and other similar entities within the 2010-2012 period.

On the basis of premises outlined above and applying the suggested 0.3 and 1.0 multipliers, an expected influx at the peak of construction (2011) may be within the range of 2,200 to 7,500 people given the total peak on-site workforce of over 12,900, out of which approximately 7,400 workers will be Mongolian Nationals (i.e. up to doubling the 2010 population of the *soum*).²⁰

Recent data prepared by Oyu Tolgoi and based on official data provides an accurate picture of actual net migration (in and out of the *soum*) to Khanbogd *soum*.

Table 8.4: Net Migration to Khanbogd Soum (Excluding Oyu Tolgoi Staff and Contractors)

Year	<i>soum</i> Population	In-migration	Out-migration	Net migration	Percentage increase due to migration
2006	2901	183	33	150	5.2%
2007	2974	126	72	54	1.8%
2008	3022	71	68	3	0.1%
2009	3154	96	50	46	1.5%
2010	3522	305	49	256	7.3%
2011 (to October)	Approx. 3900	323	86	237	7.3% (annualised)

Source: Oyu Tolgoi from Khanbogd Soum Statistical Office

From the above table, it can be seen that net in-migration during the construction phase has been significantly less than anticipated, but nonetheless annual population increases are still significant in terms of placing increased pressure on public infrastructure and other resources.

¹⁹ This assumption is consistent with observations contained in the World Bank's Foundation for Sustainable Development: Rethinking the Delivery of Infrastructure Services in Mongolia (June 2007) which observes that the Government of Mongolia's budget for operations and maintenance is completely inadequate to preserve the quality of existing roads, yet alone to develop new ones. The report is critical of overly ambitious plans to develop an extensive network of new roads that are not supported by demand forecasts. It particularly singles out for criticism the Millennium Roads Project which proposes five north-south highways extending across Mongolia from the Russian border to the border with PRC.

²⁰ See Chapter C9: Employment for more details on the Project workforce estimates.

For the **operations phase**, it is anticipated that the rate of influx into the Project Area of Influence and particularly to Khanbogd will gradually slow down, primarily due to a substantial and rapid reduction in the numbers of workforce upon completion of construction (the overall workforce reduction will be by circa 70% over a 1-2 year period). The number of Mongolian personnel will be maintained at 3,500 on average throughout the mine operation. Despite the significant decrease in the workforce demand, it is still likely that the population inflow will continue to take place as a result of favourable business environment in the Project Area of Influence, opportunities for training and skills development associated with Oyu Tolgoi vocational programmes, improved infrastructure and Oyu Tolgoi's housing. (See *Chapter C7: Economic Impacts* and *Chapter C9: Employment* for further details on economic development, job generation and business development opportunities). Based on the Mongolian workforce numbers of 3,000-3,500, the total influx during the first years of operation is anticipated to be within the range of 900-3,500.

Influx-Induced Impacts

Description of the Impact

This section includes the findings of the Influx Risk Assessment that was implemented for the Oyu Tolgoi Project in 2007, and provides further discussion on the anticipated impacts taking into consideration the Project's development up to 1 June 2011.

2007 Influx Risk Assessment

The Oyu Tolgoi Project commissioned a construction-phase Influx Risk Assessment in 2007, to identify the likely magnitude and nature of construction-phase influx.^{21,22} According to this study, population influx associated with Oyu Tolgoi will have both adverse and beneficial impacts on host communities.

Adverse impacts of population influx related to the Oyu Tolgoi Project were identified as likely to include the following:

- Risk of spontaneous settlement with attendant health, safety, law and order, land use conflict and environmental risks;
- Rising cost of living due to the increased demands created by in-migrants for land, rental accommodation, food and other staples and necessities (see *Chapter C7: Economic Impacts* for further discussion on impacts related to the increased living cost);
- Increased competition for natural resources such as land, water, pasture, firewood, etc;
- Increased demand for infrastructure and utilities such as access to electricity, heating, water, transportation, medical services and education facilities, together with an extra load placed by a growing population on the limited infrastructure;
- Spread of social adverse phenomena and health risks, such as alcoholism, substance abuse, commercial sex, gambling, introduction of communicable diseases (including sexually transmitted infections (STIs) and HIV/AIDS);
- Breakdown of law and order, including increased crime and illicit activities;
- Governance risks arising from increased local government revenue flows with insufficient controls and disbursement regulations, or from exposure of local government officials to offers of informal payments intended to facilitate registration of newcomers and allocation of land, or to provide preferential access to employment;
- Heightened risk of social conflict, including tension between host communities and in-migrants, or disagreement within host communities where differential economic impacts result in welfare imbalances and uneven distribution of wealth, with some groups benefiting while others are rendered marginalised or more vulnerable; and
- Social disarticulation and fragmentation, including breakdown of traditional values, disruption of networks and social safety nets, weakened sense of security that can in turn contribute to

²¹ Oyu Tolgoi: Influx Risk Assessment, Ivanhoe Mines and Rio Tinto, Barclay & Associates, October 2007.

²² The construction-phase risk assessment focused mainly on the fairly limited influx that had occurred in the vicinity of Oyu Tolgoi at the time of the work (2007), and used those figures to extrapolate possible future scenarios.

detrimental societal responses such as increased alcoholism, domestic violence, family disintegration and relationship failures.

The 2007 Influx Risk Assessment also concluded that influx related to the Oyu Tolgoi Project may have some beneficial impacts, such as:

- Reversal of out-migration from rural communities, including the return of better educated and more entrepreneurial individuals who had previously opted to move to regional centres or larger urban areas;
- A diversified and better quality range of goods, supplies and services available to local communities, sometimes at more competitive prices;
- Income rise and inflow of wages from Project's direct and indirect employment (including in associated sectors and businesses), resulting in the increased local spending capacity as well as stimulation and strengthening of the local economy;
- Improved business opportunities, strengthened through increased competition; and
- For remote communities, an expanded world-view and improved linkages and access to the outside world and markets.

Current Update on Influx Impacts

This section provides further update on the impacts that are expected to occur as a result of the Project-related influx into Oyu Tolgoi's Area of Influence.

Pressure on Grazing Land

The majority of in-migrants to Khanbogd *soum* are likely to be urbanised, skilled, semi-skilled and manual workers seeking employment opportunities either directly with Oyu Tolgoi or indirectly through its supply chain²³. The requirement for households to register (and de-register) with their local *soum* administration on moving, and the sheer distances involved, mean that it is unlikely that significant numbers of herders (and their livestock) would seek to migrate to Khanbogd *soum*. However, the increased incomes of those living in Khanbogd *soum* with existing herds may mean that those herd sizes increase – increasing pressure on grazing land (see *Chapter B10: Land Use* and *Chapter C10: Land Use and Displacement* for further information).

Pressure on Biodiversity and Environmental Degradation

Potential impacts on biodiversity and environmental degradation in relation to pressures on pastureland, competition with wildlife and illegal hunting are discussed in *Chapter C6: Biological Resources and Ecosystem Services*.

This issue will be addressed by the Supplemental ESIA which will consider the specific impacts arising from the worker housing development and the associated developments of infrastructure and population in Khanbogd *soum* centre.

Pressure on Public Utilities and Services

The degree and nature of impacts related to **the use and provision of utilities and services** are determined by supply and demand, namely:

- Supply – in terms of budget allocated to social infrastructure and utilities by the Government of Mongolia to *aimag* and *soum* administrations, and also any support provided by development agencies and major project developers; and
- Demand – in terms of significantly increased population levels, differently structured demographic composition and changed age profiles, leading to certain services and utilities (such as education and health care) becoming overloaded.

Social infrastructure within the Project Area of Influence is limited and underdeveloped, reflecting the low population levels and the dispersed nature of settlements. Operational performance of urban services varies but is generally characterised by low levels of access, inefficient delivery, and deficiencies in

²³ This was the experience at the Erdenet mine in the 1970s and more recently at Tsogtsetsii with the mine development by Energy Resources LLC.

quality. (See *Chapter B11: Transport and Infrastructure* for detailed description of the current situation with community services and infrastructure)

Energy Supply

Influx will further intensify the **pressure on the existing energy supply and power infrastructure** in Khanbogd *soum*, and potentially in Dalanzadgad and other neighbouring *soums* within the Project Area of Influence. The self-sufficient nature of many households in the Project Area of Influence, which results from a considerable proportion of the population living in transportable *ger* dwellings, means that the current reliance on stationary and centralised power generation systems is relatively limited. However, it is likely that in-migrants to the Project Area would concentrate in Khanbogd *soum* centre and the *aimag* capital of Dalanzadgad, where centralised power systems are available. As a result, it is likely that the demand for distributed power will increase, particularly in these locations. Furthermore, Khanbogd *soum* centre is currently dependent on expensive diesel-generated power and a shift to a cheaper source of power (via a high voltage connection to the Oyu Tolgoi Project supply) is critical to supporting future development of the *soum*.

Water Provision

As described in *Chapter B11: Transport and Infrastructure*, the Khanbogd community is currently supplied from tanked-in water and communal wells which are fitted with small pumps, and only circa 1% of households in the *soum* centre are connected to a piped water supply. The rural areas of Khanbogd *soum* have no access to central water supply. Only just over half of households (56%) obtain water from protected wells, whilst 43% obtain their water from unprotected wells.

There are three principal issues in relation to community impacts of the Oyu Tolgoi Project on **water supply**:

- Provision of water for the mine-site operations;
- Provision of water to the resident population of Khanbogd *soum* (current population and taking into account the predicted growth caused by the influx); and
- Disruption to water supplies for rural population and particularly herders.

During the construction phase, Oyu Tolgoi is abstracting water from shallow boreholes within the Mine Licence Area for potable and industrial uses. As there are no other users of these water boreholes, this water abstraction by the Project is not forecast to impact other water users and to have no significant impacts on herder wells outside the Mine Licence Area. During the construction phase, a diversion system will be established for the Undai ephemeral watercourse to divert surface and sub-surface flows around the open pit area and to rejoin the existing course of the Undai further downstream outside the Mine Licence Area. This will directly impact the Bor Ovoo spring which lies within the Mine Licence Area and which is used for water supply by herders and wildlife. (See *Chapter C5: Water Resources* for further information about Project's impacts on herder water supplies and the provision of a sustainable water supply in support of the operational phase and Oyu Tolgoi activities to maintain continuity of supply for herder wells and to provide a sustainable water supply to support the development of Khanbogd).

At Khanbogd the community water supply is envisaged to move from individual and community wells towards a reticulated system which draws water from the local shallow aquifer, and water demands will increase as the population of the community grows and economic activity increases. This will result in an increasing demand on the groundwater resources of the area.

Oyu Tolgoi is working with the Water Authority and Governor of Khanbogd and other organisations to identify and develop an alternative water supply for Khanbogd²⁴. The optimum location of the supply wells is currently the subject of on-going studies by Oyu Tolgoi, as part of this programme three wells have been drilled approximately 6 km to the northeast of Khanbogd and have proven a significant groundwater resource of potable water (see *Section B6.10*). This basin containing this water resource is inferred to be recharged annually by rainfall and bedrock flows from the Khanbogd Massif to the south and Durulj Mountain to the north. Oyu Tolgoi is currently defining this resource and agreeing the resource estimate with the Water Authority. Oyu Tolgoi is also assisting develop plans for the water reticulation system in conjunction with the Water Authority and Governor of Khanbogd, Asian

²⁴ This reflects the commitment to support the Government in the establishment of safe drinking water for the local *soum* centre directly impacted by the Oyu Tolgoi Project – Clause 6.15 of the Investment Agreement (2009)

Development Bank and others. The first phase of the development of the *soum* water supply is designed to deliver 30 l/s, and will have the capacity to increase this in the future as Khanbogd demand grows through development and influx. Tied into the water supply will be a wastewater treatment plant which will seek to recycle/reuse water once treated; work on this area is still under development.

This issue is discussed in more detail in *Chapter C5: Water Resources*. This issue will be addressed by the Supplemental ESIA which will consider water supply for Khanbogd *soum* centre and for the Oyu Tolgoi worker accommodation development.

Sewerage and Sanitation

Growth of the Khanbogd *soum* population due to the Project-induced influx will further exacerbate the already existing pressure on the **poor sanitation** infrastructure. There is currently no centralised sanitary waste collection system in Khanbogd and the absence of such critical facilities together with a lack of proper lavatory systems will lead to the spreading usage of unequipped and unsanitary makeshift solutions, especially in informal mobile settlements. This will be a likely factor in creating conditions that are conducive for the transmission of infections, including vector-borne diseases. The increased use of pit latrines may also trigger bacterial contamination of drinking water from private wells in *soum* centre and in other settlements. Development of a denser urban core and multiple-storey buildings will require the provision of reticulated sewerage systems and wastewater treatment.

Solid Waste

At present, there is only limited **solid waste management** service in the four *soums* within the Project Area of Influence (Khanbogd, Bayan-Ovoo, Manlai, and Dalanzadgad). The Khanbogd *soum* centre has intermittent waste collection and waste disposed is to a partially-fenced open dumpsite²⁵. The influx-related growth of local population will further increase the pressure on the existing waste management infrastructure in the Project Area which is still underdeveloped (see *Chapter D8: Waste Management Plan*).

Solid waste from the Oyu Tolgoi CIS camp is currently removed to the Oyu Tolgoi waste management facility (within the Mine Licence Area) for disposal.

In order to address the increased pressures on waste management, a new purpose-build landfill facility is planned to be developed with the support of the Asian Development Bank.

Medical Facilities

In terms of **health care**, it is anticipated that the implementation of the Oyu Tolgoi Project will result in an increase of population of reproduction ages and resultant pressures on Reproduction Health Centres and Family Consultancy Centres in the Project Area of Influence. A rise in Sexually Transmitted Infections (STIs) rate is also likely, which may be attributable to the large numbers of a predominantly male workforce and the emergence of commercial sex activities among 'camp followers'. Estimates of Project-related in-migration suggest that additional medical personnel will be required particularly in Khanbogd and Dalanzadgad *soums* during the construction phase. Oyu Tolgoi is in discussion with local government about how best to meet these increased needs and has provided a range of local medical initiatives including the establishment of a medical scholarship programme that has led to an additional 14 trained doctors coming to work in Omnogovi *aimag*, the establishment of a dental surgery in Khanbogd, the establishment of Health Consultancy Centres across the *aimag* and the planned establishment of a trauma centre at Javkhlant *bagh* centre.²⁶ Increases in population and alteration in the population age profile will also create an increased demand for acute medical services provided by hospitals, together with emergency aid that may be required in case of major incidents. (See *Chapter B13: Community Health, Safety and Security* for further detail on health impacts, including communicable diseases).

Education Services

Pressure on the provision of **educational services and facilities**, including pre-schooling (nurseries and kindergartens) and schools – both in terms of the number of buildings and pupil capacity, availability of teaching staff (including teacher/student ratio) and equipment, will potentially affect the overall

²⁵ Oyu Tolgoi Project Socio-Economic Impact Assessment, Final Report, September 2009. Centre for Policy Research, Population Training and Research Centre, School of Economic Studies, Mongolia National University.

²⁶ Community Health, Safety and Security (CHSS) Impact Assessment of the Oyu Tolgoi Project, Khukh Tenger Khugjil Konsortium (KTKK), 2011 (KTKK Field studies conducted in 2010).

accessibility and quality of education and the levels of educational attainment, and may impose constraints on Oyu Tolgoi's ability to hire appropriately educated local workers in the medium and long term. The baseline survey indicated that there are already pre-existing shortages of qualified teachers, books and school buildings. Although the schools in the Project Area of Influence are equipped with computers, there is no internet access and electricity supply is unreliable.²⁷

Assuming based on the general population age distribution at regional level that about 25% of in-migrants to the Project Area of Influence are of school age, it can be inferred that an additional 550 to 1,875 school places will be required during the Oyu Tolgoi construction phase. The majority of these additional school places will be required in Khanbogd and Dalanzadgad, as centres of in-migration. Recent evidence suggests that arrival of migrants in Khanbogd is already placing significant pressure on educational resources with pupil numbers exceeding planned capacity by a significant margin.²⁸

Overall, the population influx in combination with the poor infrastructure and inadequate service capacity in the Project Area of Influence have a potential to result in the following problems:

- Reinforcing the current vulnerabilities of the local communities when exposed to an additional substantial demand and pressure placed by in-migrants; and
- Exacerbating competition for the limited resources and social services that are already in shortage or are lacking, thereby creating conditions for conflict and community disintegration.

The existing deficiencies in the vital infrastructure and basic services will become further accentuated as a result of the influx, which detrimentally affects the overall standard of living and leads to people's undermined sense of well-being and security, particularly in relation to their individual and the community's future.

Expansion and improvement of social infrastructure and other critical community facilities and services together with boosting their capacity and quality is fundamental to successfully coping with rapid population changes triggered by the Project-related influx. This task requires a concerted effort including advance planning and coordination by the Oyu Tolgoi Project, government bodies and other relevant stakeholders, to ensure that the necessary infrastructure components and essential services are in place, of adequate capacity, and are sufficiently reliable to support the growing population in the Project Area of Influence.

These issues will be addressed by the Supplemental ESIA which will consider increased pressures of public infrastructure and services within Khanbogd *soum* related to the operation of the Oyu Tolgoi Project.

Inflationary Pressures

Within Khanbogd *soum*, local prices and the cost of living in general can be expected to rise early in the Oyu Tolgoi construction phase. No data are yet available at a *soum* level to demonstrate that local consumer price inflation has started to occur, although consumer price inflation is recorded across all regions of Mongolia.²⁹ The main causes of the appreciated cost of living and inflated prices are expected to be as follows:

- Increase in local expenditure related to Oyu Tolgoi activities and other development projects in the area;
- Increase in the spending ability of local population, facilitated by the shift from subsistence to waged labour; coupled with
- Enhanced access by population to savings and credit.

Until local businesses have matured enough to be able to accommodate the growing demand adequately, the competition for insufficient resources and services from the major-scale projects will drive local prices upwards. This trend will also be exacerbated by a rising demand for goods and service provision placed by the growing population as a result of the predicted population influx into the *soum*. In addition, the underdeveloped local markets are likely to respond with inflationary increases to the enlarged proportion

²⁷ See also *Chapter B13: Transport and Infrastructure* for further details on educational facilities and constraints.

²⁸ Personal communications from meeting with Khanbogd Community Reference Group, September 2010.

²⁹ Mongolia National Consumer Price Index, June 2011.

of the population with considerable disposable incomes – mainly employees of the mining sector and expatriate personnel. This effect will result from the presence of a greater number of people whose higher purchasing power enables them to absorb rising prices for housing, food products, eating out, transportation services, medical care, leisure, and other items of expenditure.

Upward prices will in turn affect the overall cost of living i.e. consumer prices, rent, groceries, transportation and utilities and are directly correlated with inflation. The cost of living is anticipated to rise locally and at a wider regional level due to the presence of Oyu Tolgoi and other major developments that are already underway or are planned (see also *Chapter C13: Cumulative Impacts*).

Effects of the rising living costs and general price increases will be felt differentially within the *soum* community. As of June 2011, a total of 73 individuals from 15 families were identified by the Labour & Social Welfare Office as vulnerable in Khanbogd *soum*.³⁰ The capacity to absorb the inflationary effects will also pose a challenge for people whose incomes are fixed (such as public sector employees) or are not regularly adjusted to offset the changing economic conditions. Prices are expected to stabilise in the operations phase given the decrease in workforce demand compared to the construction phase, gradual outflow of some economic migrants and improved performance of local businesses.

The impact of price increases within Khanbogd *soum* and the increased reliance on a cash-based economy is discussed in *Chapter C7: Economic Impacts*. As a result, the mitigation measures set out in that chapter are not discussed in this chapter. This issue will be addressed by the Supplemental ESIA which will consider economic impacts to Khanbogd *soum* and to traditional herder lifestyles related to the accommodation options for the operation of the Oyu Tolgoi Project.

Pressures on Traditional Herder Lifestyles

The transition from nomadic herding to waged employment will be accelerated through the arrival of major mining projects to the South Gobi. It is inevitable that significant numbers of herders will take up employment with these companies and some employment has already occurred. The loss of traditional livelihoods is an unavoidable adverse impact on intangible heritage. This can be partly mitigated by the Project through equal employment opportunities and observance of cultural traditions at work. To date, Oyu Tolgoi has managed to balance the pressures on local herders by offering employment opportunities that can be undertaken while remaining as an active herder. Such activities include acting as wildlife rangers/monitors and involvement in Oyu Tolgoi environmental monitoring programmes.

The impact of pressures on traditional herder lifestyles and the increased dependence on a cash-based economy within Khanbogd *soum* is discussed in *Chapter C11: Cultural Heritage* and *Chapter C7: Economic Impacts*. As a result, the mitigation measures set out in that chapter are not discussed in this chapter.

This issue will be addressed by the Supplemental ESIA which will consider impacts on traditional herder lifestyles related to the accommodation options for the operation of the Oyu Tolgoi Project.

Potential Gender Imbalance

To date, the majority of Oyu Tolgoi workers living in Khanbogd *soum* centre have either been workers from existing local families or female workers living in the CIS camp on the outskirts of Khanbogd *soum* centre. As a result, the typical gender imbalances often associated with mine developments (and consequential impacts in terms of alcohol, violence, prostitution and sexual assault) have not occurred to date.

This issue will be addressed by the Supplemental ESIA which will consider worker housing. It is anticipated that operational worker housing will be developed principally for workers with families, and that single workers will continue to live in camps within the Mine Licence Area. As a result, gender imbalance is not anticipated to be a significant issue, but this will be confirmed by the Supplemental ESIA.

Increased Pressures on Personal Safety and Well-Being

As discussed in *Chapter C12: Community Health, Safety and Security*, an influx of workers and other people into local communities, as well as changes to the traditional land-based way of life, could result in a number of potential personal safety and well-being impacts, including:

- Increased crime;

³⁰ Khanbogd *Soum* Social and Welfare Office Statistics, 2011, as reported by CRSD.

- Increased alcohol related illnesses and incidents;
- Pressure on police and public services;
- Reduction in well-being of herders; and
- Human trafficking.

Personal safety issues have been identified as a concern by local communities during consultation, and these include threats to personal security and property as a result of unruly or disruptive behaviour by workers or other individuals new to the local area.³¹ Crime in Khanbogd and neighbouring *soums* has previously been very low. The total number of crimes recorded in the *soum* in 2009 and 2010, were 41 and 38 respectively – however, the perception is that this situation is changing.³² Herders are reported to feel particularly vulnerable to theft and other property and personal crimes; theft was never an issue in the past, and herders rarely locked anything. Now there is increased contact with strangers - and young motorbike riders for example, can ride right up to the *ger*.³³ Impacts from increased crime may include loss of property and livelihood, assault (physical/sexual) and perceived loss of personal freedom. The community perception is that workers and contractors may be willing to commit petty crimes, such as theft, following the consumption of alcohol.

Diseases and injury related to changes in lifestyle (trauma, violence-related, traffic accidents and alcohol-related disease) have shown a marked increase in Mongolia in the past five years.³⁴ In 2007 in Omnogovi *aimag* alone, 3,076 people were treated in alcohol rehabilitation centres. This was a 16% increase compared to the previous year. Alcohol has become such a social problem in the *aimag* (as elsewhere in Mongolia) that every Wednesday is designated an “alcohol free” day when there is a ban on buying or selling alcohol anywhere. Health staff in *soums* in the Project Area of Influence also reported to the CHSSIA field study team that they are seeing more acute alcohol intoxication and alcohol related injuries.³⁵ Increased crime and anti-social behaviour would stretch the limited capacity of police units at Khanbogd, Tsogtsetsii, and Bayan-Ovoo *soums*.

There is also a potential risk that Oyu Tolgoi and other mining activities in the region could contribute to increased human trafficking, due to the growing presence of outsiders, extensive transport movements and the prospective extended opening of the China border. The CHSSIA conducted for Oyu Tolgoi in 2010, concluded that potential human trafficking risks currently remain low, although new problems may emerge as the local population grows and mining activities increase in the region (related both to Oyu Tolgoi and other projects).

Local project workers may also experience threats to safety and well-being associated with work schedules and potential workforce conflicts. Typically, the working parent (usually male) goes away for 3 weeks (working a 3 weeks on 1 week off roster), and the other parent may have other daily work, resulting in both parents being absent. Many pre-school and school age children have no or limited child care because of their parents’ work commitments. There are no suitable childcare facilities available, and kindergarten facilities are over-capacity. Family separation, limited access to money, and increasing use of alcohol are reported to be leading to stress and relationship breakups.³⁶

During 2010 a number of security incidents arose relating to the construction workforce. These included conflicts between construction workers of different nationalities, conflicts between people of the same national group, as well as reports of harassment of local female Mongolian workers. The Rio Tinto Global Security and Communities functions conducted a Workforce Conflict Assessment of the Oyu Tolgoi

³¹ Oyu Tolgoi Project Socio-Economic Impact Assessment, Final Report, September 2009. Centre for Policy Research, Population Training and Research centre, School of Economic Studies, Mongolia National University. p67.

³² Khanbogd *soum* Governor’s Office, obtained by Oyu Tolgoi in 2011, cited in *B15: Community Health, Safety & Security (baseline conditions)*.

³³ Community Health, Safety and Security (CHSS) Impact Assessment of the Oyu Tolgoi Project, Khukh Tenger Khugjil Konsortium (KTKK), 2011 (specifically KTKK Field studies conducted in 2010).

³⁴ World Health Organisation, Country Cooperation Strategy, Mongolia 2006, cited in *B15: Community Health, Safety & Security (baseline conditions)*.

³⁵ Community Health, Safety and Security (CHSS) Impact Assessment of the Oyu Tolgoi Project, Khukh Tenger Khugjil Konsortium (KTKK), 2011 (specifically KTKK Field studies conducted in 2010).

³⁶ *Ibid*, CHSS Impact Assessment, KTKK, 2011.

Project in November 2010³⁷, including the potential impact such conflicts could have on both the Project and the community. The assessment team met with a broad range of internal and external stakeholders and identified risks and potential conflicts. In order to prevent these conflicts from happening and escalating into violence, the assessment team presented a series of recommendations. These workforce issues are of significant concern to Oyu Tolgoi. Following the Workforce Conflict Assessment, Oyu Tolgoi finalised its *Site Security Response Plan: Workforce Violence* in January 2011³⁸. The objective of this plan is to protect the people, reputation and assets of Oyu Tolgoi.

A series of follow-up meetings in 2011 have included a Community Open Day where grievances were raised at a meeting with Oyu Tolgoi staff and the Khanbogd *soum* Governor, and a meeting between community representatives and CIS management which was held to clarify concerns regarding CIS operations and to provide updated information on grievances.

Mitigation Measures

The following sections describe in detail the sets of measures that will be employed by Oyu Tolgoi to mitigate impacts resulting from population influx into the Project Area of Influence.

Mitigations related to increased pressures on grazing land are addressed in *Chapter C10: Land Use and Displacement* and are not discussed further in this chapter. Similarly, mitigations regarding pressures on personal safety and well-being are discussed in *Chapter C12: Community Health, Safety and Security* and are not discussed further in this chapter.

Overview of Influx Mitigation Approach

The Oyu Tolgoi strategy and programmes for influx management are based on recommendations made in the 2007 Influx Risk Assessment. Additional information used to develop the Oyu Tolgoi influx management approach includes an updated Project design, results from the ongoing consultation with local communities and government, and the requirements set out in the Oyu Tolgoi Investment Agreement.

Although Oyu Tolgoi does not have the authority to exert direct control over population movements and migration paths, the Project can influence the movements of workers and suppliers through a regulated and planned process of hiring/employment, procurement, and workforce residential arrangements. In particular, the Project can exercise substantial control over matters such as:

- Where workers are recruited, thereby preventing the spread of informal and counterfeit/unauthorised hiring venues beyond the designated points of hire;
- Where workers are housed, helping to avoid/minimise an unregulated settlement sprawl;
- The availability and quality of energy and water supply, sanitation, as well as other provisions to the Project workforce and wider community and the elements of infrastructure where these services are impacted;
- How and where workers are mobilised from and demobilised to, thereby maximising the local content of Project workforce and optimising workforce movements and flows;
- Worker conduct and a level of interaction with the communities in the Project Area of Influence, through operating dedicated camps and enforcing codes of appropriate behaviour for Project's and contractor personnel;
- Investment in training and professional development of the local workforce, thereby reducing the need for outsourcing personnel from outside the Project Area of Influence; and
- Procurement activities and supplier development support aimed at prioritising local and regional suppliers and service providers, helping to establish the local business base and strengthen its capacity.

The following sections describe specific measures employed by the Project with the aim to alleviate negative impacts resulting from the population influx, together with Oyu Tolgoi's plans for the provision of services and utilities to strengthen the local communities' resilience to the impacts caused by the influx.

³⁷ Oyu Tolgoi Conflict Assessment. Rio Tinto Oyu Tolgoi Internal document. December 2010.

³⁸ Oyu Tolgoi Security Response Plan January 2011.

Preferential Local Recruitment

The Project has developed recruitment and hiring procedures and policies that are aimed to:

- Deter speculative influx resulting from the arrival into the Project Area of Influence of opportunistic economic migrants driven by heightened expectations of finding jobs;
- Maintain a secure and safe site; and
- Reduce a likelihood of fence-line communities emerging in and around Project work sites.

Under its employment strategy, Oyu Tolgoi gives preference to local workers from the *soums* in the Project Area of Influence (Khanbogd, Manlai, Bayan-Ovoo and Dalanzadgad) and the wider Omnogovi *aimag*. This approach is in line with the requirements of the Investment Agreement, namely:

- *Clause 4.8* "The Investor shall give priority focus to those Omnogovi *aimag* citizens and groups directly and indirectly impacted by the Oyu Tolgoi Project";
- *Clause 4.11* "The Investor shall make as a priority training, recruiting and employing citizens of local communities in the southern Gobi region, with preference to Omnogovi *aimag*";
- *Clause 8.5.1* "For construction work during the Construction Period and Expansion Periods, not less than sixty percent of the entities' employees will be citizens of Mongolia"; and
- *Clause 8.5.2* "For mining and mining-related work, not less seventy five percent of the entities' employees will be citizens of Mongolia".

Prioritising the local/regional workforce hire and developing the skills of local labour resources through training support will help avoid the need to import large numbers of workers from outside the Project Area. This approach is optimised through the following measures:

- Recruiting the local workforce only from designated recruitment offices with a strict 'no site-gate-camp' hiring policy. To minimise informal influx into the Project Area, Oyu Tolgoi has adopted a policy not to hire at temporary work sites or construction camps during construction, or at the site gate/office for the duration of the Project; and
- Prohibition of informal hiring, to prevent the spread of unregulated and speculative recruitment practices within Khanbogd *soum* and to deter an inflow of migrants searching for 'easy' work opportunities.

The recruitment and hiring procedures adopted by Oyu Tolgoi are widely advertised, together with specifications and requirements for all jobs available, which intends to prevent an inflow of candidates who do not qualify and so that aspiring job seekers are not tempted to use informal routes to obtain employment.

The Oyu Tolgoi policy on preferential recruitment and employment and other associated measures are described in detail in *Chapter C9: Employment* and *Chapter D17: Labour Management Plan*.

Worker Accommodation

Oyu Tolgoi's approach to accommodating its personnel represents a combination of the following:

- Camp-type residential facilities for construction workforce; and
- employee accommodation taking into consideration integration with existing population centres and meeting the needs of the Project..

Construction Camps

The Oyu Tolgoi workforce will reach in excess of 12,900 at the peak of construction phase. In May 2010, 16% of the Project workforce came from Omnogovi *aimag*. At the end of 2010, the total of 629 people from Khanbogd *soum*³⁹ were employed by Oyu Tolgoi and its contractors, As at February 2011, out of a total of 5,513 Project personnel (including contractors), 3,789 workers were Mongolian citizens. These employees are working on construction, camp management and catering, drilling, earthmoving, rigging and maintenance roles.

³⁹ These figures include people of Khanbogd origin, and do not count people now residing in Khanbogd who have migrated into the area from elsewhere in Mongolia.

During the Project construction phase, workers live in either purpose-built camp accommodation on site or in Khanbogd at dedicated camps and travel to work on a bus-in/bus-out (BIBO) basis. Workers who are locally resident in Khanbogd are transported to the mine on a daily basis to their work locations on a rotational shift basis in common with all other workers.

All construction workers hired from locations other than Khanbogd are housed within dedicated construction camps as follows:⁴⁰

- Oyu Tolgoi Construction Camp (2,451 beds);
- Consolidated Contractors Camp for Chinese contractors (CCC) (4,704 beds);
- Khanbogd Construction Camp (CIS) (1,536 beds);
- Temporary Construction Camps – North and South, at the water pipeline and the road to China, respectively, with 1,000 to 1,500-bed capacity for each camp; and
- Temporary Construction Camp in Khanbogd for 750 beds.

During the construction phase, workers (both Oyu Tolgoi workers and construction contractors) live in on-site camps and are not permitted to leave their camps for recreational purposes. All the construction contractor camps are autonomous and operated on a self-contained basis, therefore minimising workers' interaction with the neighbouring communities and the need for the workforce to use community infrastructure.⁴¹ Family-type accommodation is not provided at the site, but is available in Khanbogd for eligible workers who meet the specific accommodation criteria.

Housing for Operations Personnel

The current plan for work rotations and transportation requirements can be summarised as follows, although this is subject to review and updating based on the housing strategy adopted for the Project operational phase:

- All Mongolian workers recruited and employed from Khanbogd *soum* work on a day-shift or night-shift basis (i.e. daily commute) and are transported by bus (BIBO) from and to Khanbogd *soum* centre;
- All Mongolian employees recruited and employed on a “non-local” basis work on an 8-2 week rotational basis, and are based in camp on site during their eight ‘on’ weeks. These employees either BIBO or FIFO, depending on the distance, to their home *soums*/or other locations for the home leaves, i.e. for the two ‘off’ weeks;
- Expatriate workers are based at the on-site camp and “FIFO” to their home countries on a six-week-in, two-week-out rotation, working 12 hours per shift (or other nominated roster); and
- Senior management of Oyu Tolgoi work a five-day-in and two-day-out rotation between the Oyu Tolgoi site and Ulaanbaatar.

Power and Energy Supply

Over the past few years, the Project has been supplying diesel for the main electricity generator in Khanbogd as a means of contributing to the local energy provision. The Project itself is self-sufficient in power through the use of on-site diesel generators.⁴²

Oyu Tolgoi, recognises that a growing demand for additional fuel supplies is to a large extent caused by the Project-related population inflow, and that the provision of assistance with an upgrade of local power generation and distribution systems is therefore crucial.

Oyu Tolgoi's activities aimed at improving power and heating provision in its Area of Influence presently include the following:

- Funding construction of a 35 KV power transmission line to supply Khanbogd's existing power distribution network; and

⁴⁰ Ref. Section 13.8 of IDOP.

⁴¹ See Oyu Tolgoi *Camp Conduct and Code of Behaviour*.

⁴² The Oyu Tolgoi camp at Khanbogd also has its own diesel generator and is self-sufficient in terms of power supply.

- Renovation of the district heating system, which will complement activities proposed under the ADB-funded development project for Khanbogd.

District heating improvements will involve augmentation and some rehabilitation of existing systems and provision of new systems as necessary. The Project will provide new boilers, pumps, and boiler houses in some cases, combined with the replacement of inefficient pipes and exchangers to produce more efficient heating systems.

Water Monitoring and Supply

Water Monitoring

Although the Project construction activities are not anticipated to have a significant direct impact on the herder wells, selected herder wells will be monitored as part of the Project's water monitoring programme. Oyu Tolgoi currently monitor 333 herder wells. Oyu Tolgoi will implement a **Participatory Environmental Monitoring Programme** with the local community to ensure that monitoring of water levels and quality in the herder wells is undertaken in a transparent manner that builds and maintains trust between the Project and local herders. If any issues are identified as a result of the monitoring, Oyu Tolgoi will closely work with potentially affected herders to develop, implement and monitor the effectiveness of a mutually-acceptable solution (such as the provision of an alternative water supply through the drilling of a new water borehole).

Arrangements for Khanbogd Water Supply

The Khanbogd *soum* Government requested that Oyu Tolgoi conduct **groundwater exploration** in the vicinity of Khanbogd for the following purposes:

- To identify an adequate and sustainable water supply resource sufficient to serve the growing population of Khanbogd; and
- To determine the capacity of available groundwater reserves to accommodate an increased demand for water supply.

This requirement is consistent with the Investment Agreement which commits the investor to assisting the Government of Mongolia with addressing issues related to urban planning and development, including water supply. Oyu Tolgoi has successfully undertaken numerous and detailed investigations as part of a borehole drilling programme and has identified and tested a highly-productive, non-saline, potable groundwater source to be used for sustainable local water supply. The overall quantity of drilling carried out was: 7 core drill bores totalling 1312 m, 7 exploration bores totalling 1294 m, and 3 production bores totalling 370 m.

Chemical composition of the ground water has also been tested and the quality fully meets the water quality standard of Mongolia and WHO. No bacteriological pollution was identified. In order to prevent any risks during the operation and utilisation of water, chlorination or an equivalent approach (most likely, ultraviolet irradiation) will be carried out at the exit from the ground storage.

Further assessment is currently being undertaken by the Project to determine the amounts of water reserves identified and to implement a detailed design for the provision of bulk water supply. The cost of capital works for the development of a water supply system will be offset against water fees payable by Oyu Tolgoi to the Khanbogd *soum* administration. It is envisaged that the Asian Development Bank will be a development partner in this initiative, through providing funding for the establishment of water distribution and supporting associated institutional reform.

Sanitation Improvements

The Oyu Tolgoi Project operates a self-contained tertiary wastewater treatment plant on-site. At present, treated effluent is used in part for dust suppression purposes. As part of the Project's efforts to minimise net water consumption, treated effluent is also used during construction to provide part of the water supply for the production of concrete.

The Mongolian Government and ADB are currently supporting the development in Khanbogd of a reticulated sewerage system and treatment in ponds. In support of this, Oyu Tolgoi will move sequencing-batch reactor sewage treatment plants from its temporary construction camps to Khanbogd when the camps close upon commencement of operations. The CIS camp outside Khanbogd currently uses an evaporation pond for sewage sludge treatment. Sludge will be removed and disposed to the sludge

ponds operated in the Mine Licence Area and the evaporation pond will be replaced by a biological waste water treatment plant.

Solid Waste

In terms of solid waste management, the Oyu Tolgoi Project will ensure that all waste generated as a result of its activities is collected and transported to authorised sites where it can be recycled or disposed of to sanitary landfill sites⁴³. This will entail development of new landfill sites and provision of collection and landfill equipment.

The Project itself will be self-sufficient in terms of waste management. At present, there is an existing waste management facility on the site which is used exclusively for waste generated by the Oyu Tolgoi Project. This interim waste management facility is a temporary installation, and a dedicated **Waste Management Centre** will be constructed for Project operations in the northeast section of the Mine Licence Area. The Waste Management Centre will comprise an initial lined landfill cell and two leachate evaporation ponds and will be constructed prior to the commencement of commercial mine production. Additional landfill cells and leachate evaporation ponds together with a recycling / composting facility will also be constructed as the Project progresses. Recyclable metals and wood are collected and recycled by local contractors.

Oyu Tolgoi, Mongolian Government and ADB are jointly supporting development of the waste collection system and a purpose-built landfill facility for Khanbogd *soum*.

Medical Services

Oyu Tolgoi has undertaken a range of initiatives over the past few years aimed at increasing the accessibility and quality of health service for the local population, including:

- A 5-year scholarship programme for 23 doctors (2004-2009). At present, 14 of the doctors trained are working in Omnogovi *aimag*;
- During 2006 – 2008 Health Consultancy Centres were established in twelve *soums*. In total, US\$300,000 was spent on funding this Project;
- A dental surgery was established in Khanbogd *soum*; and
- An assessment of the capacity of health organisations and service outreach has been conducted in Omnogovi *aimag* (see *Chapter B13: Community Health, Safety and Security*). Oyu Tolgoi continues to implement a doctor support programme and will also establish a trauma centre at Javkhlant *bagh*.⁴⁴

The provision of public medical services remains a primary responsibility of the Government of Mongolia and the respective *aimag* and *soum* administrations. In support of this and to assist the Government in the planning of health service provision, the Oyu Tolgoi Project has commissioned a Health Impact Assessment (HIA) as part of a long-term **Community Health, Safety and Security Programme** (CHSSP). The HIA commenced in June 2010 and is being implemented by Khukh Tenger Khugjil Konsortium (KTKK). Based on the HIA findings⁴⁵, a long-term programme will be developed as follows:

- Years 1-3 to be detailed and fully costed and will include implementation of priority community programmes, together with progressive engagement and advocacy to develop a broad based multi-constituency CHSSP for the long term;
- Years 3-6 to be described as the scale up or incremental build up of programmes to improve the health, safety and security of the Omnogovi residents. This implies the progressive engagement and participation of additional partners; and
- The 20-year vision which in broad terms creates a picture of the future state of health, safety and security in the Omnogovi *aimag*, and also maps a potential pathway to achieve this vision.

⁴³ See *Chapter D8: Waste Management Plan* for further details.

⁴⁴ Community Health, Safety and Security (CHSS) Impact Assessment of the Oyu Tolgoi Project, Khukh Tenger Khugjil Konsortium (KTKK), 2011 (KTKK Field studies conducted in 2010).

⁴⁵ Community Health, Safety and Security (CHSS) Impact Assessment of the Oyu Tolgoi Project, Khukh Tenger Khugjil Konsortium (KTKK), 2011 (KTKK Field studies conducted in 2010).

The CHSSP will adopt a health systems approach, and will be focused on the six building blocks of health systems as defined by the World Health Organisation (WHO), which are:

- Service delivery;
- Healthy workforce;
- Information dissemination;
- Medical products, vaccines and technologies;
- Financing; and
- Leadership/governance⁴⁶.

As the public sector plays a primary role in the provision and management of health systems, the CHSSP will be developed as complementary to the existing and planned health, safety and security initiatives and policies led by Mongolian Government and, to an appropriate degree, to the non-governmental and donor-funded projects including those of the World Bank, Asian Development Bank, Millennium Challenge Account, and United Nations Development Programme, as well as major NGOs.

Recognising the limitations of wholly private sector-driven health service delivery, a strategic objective of the CHSSP will be to integrate mechanisms that facilitate institutional and individual capacity building and encourage public-sector (and where appropriate, civil society sector) actors to assume ownership of programme components over time. Accordingly, the Programme will have a strong emphasis on sustainability, and will closely involve applicable public-sector agencies and institutions, such as the Ministry of Health, *aimag* Health Department, *soum* hospitals, and the State Inspection Authority.

Chapter B13: Community Health, Safety and Security provides further information on community health, safety and security issues, impacts and associated management plans and mitigations.

Educational Requirements

In accordance with the Clause 8.12 of the Investment Agreement, Oyu Tolgoi has developed a training strategy to develop the necessary skills and capabilities within the Mongolian labour force to meet the needs of Oyu Tolgoi and the local content requirement. Oyu Tolgoi is also committed to investing in the long-term vocational/professional training, scholarship and apprenticeship programmes intended to equip local workers with the expertise and skills that are applicable to the mine and its operations. Training will focus on areas such as construction trades, mechanical trades, occupational health and safety, nursing, mill operation, secretarial skills, technical/engineering specialities. (See *Chapter C9: Employment* and *Chapter D17: Labour Management Plan* for further details on Oyu Tolgoi's training obligations and activities).

In addition, the Project will implement the following:

- Co-financing of the Khanbogd school extension together with the Mongolian Government;
- Construction of extension to the Khanbogd kindergarten;
- Refurbishment of five existing technical and vocational (TVET) colleges and the establishment of two new TVET colleges in Dalanzadgad and Nalaikh; and
- In addition, consideration is being given by Oyu Tolgoi to support for a new kindergarten in Khanbogd, and private educational institutions operating in Ulaanbaatar are giving consideration to establishing facilities in Khanbogd.

Impact Significance

Impacts associated with the in-migration into the Oyu Tolgoi Project Direct Area of Influence are expected to be **moderate adverse**, based on their **localised** extent, and are **certain** to occur, and **medium-term** duration, as they will be manifested both during the construction stage and in the course of operations. Implementation of the entire set of mitigation measures described above will allow the residual significance of the overall impact to be reduced to **minor adverse**. Evidence to-date indications that impacts to date have been minor, with relatively limited influx having occurred. It is acknowledged that forecasting future levels of influx is a difficult process and the Supplemental ESIA will provide the

⁴⁶ See http://www.searo.who.int/LinkFiles/Health_Systems_EverybodyBusinessHSS.pdf

opportunity to update this assessment in the light of improved knowledge and information with regard to the operations phase.

This impact assessment will be completed in more detail in the Supplemental ESIA and greater certainty over the location and nature of Project facilities will allow a more precise assessment of impacts and associated mitigations to be developed for the operations phase.

8.3.4 Uncontrolled Artisanal Mining

Description of the Impact

In Khanbogd *soum*, households interviewed during the influx risk assessment in 2007 indicated that some Khanbogd families were reliant on **artisanal mining** as an informal cash earning activity and a social safety net.^{47,48} Previously, local artisanal mining was reportedly focused on Iraq Hill (a *ger* settlement circa 130 km south-west of Khanbogd *soum* centre in the Small Gobi Strictly Protected Area) which is located in adjoining Dornogovi *aimag*, but primary access to this area is by a road that passes through Khanbogd.

Although since the time of the study illegal artisanal and small-scale mining (SAM) was closed down by the Government of Mongolia in May 2007, and has shown no signs of re-emerging, a potential remains for the recurrence of these activities as a result of the influx.

Key issues related to artisanal mining as related to the Oyu Tolgoi Project include the following:

- Project-induced influx may lead to a resurgence of local artisanal mining activity as in-migrants may turn to transitional opportunistic income while seeking to obtain formal employment with Oyu Tolgoi;
- Artisanal miners are often a high-risk health group which, by its illegal nature, can be difficult to reach by conventional health services. Artisanal miners also typically have a high potential to attract the services of commercial sex workers;
- Artisanal mining is largely reliant on extra-legal channels for moving and selling milled gold, often to buyers in China. These same channels could potentially function as an avenue for disposal of ore or concentrate pilfered from Oyu Tolgoi operations;
- Due to their illegal activity, artisanal miners settlements typically raise challenging security issues, which have potential to affect the autochthonous community; and
- The presence of groups of artisanal miners places additional pressure on the community-based services and resources which are already limited.

Artisanal mining has also been associated with a number of other adverse impacts notably in terms of the degradation of land and water resources, lax health and safety practices, together with competition and conflicts for resources. Particular concerns have been expressed about the miners' use of mercury in the amalgamation process and of the health risks associated with roasting the amalgam to extract gold. Other social problems related to unregulated artisanal mining and the associated informal *ger* settlements include substance abuse, illicit trade, and gambling.

Mitigation Measures

The following mitigation and monitoring activities are planned by the Oyu Tolgoi Project Communities and Social Performance Department to prevent the occurrence of unauthorised artisanal mining activities:

- Develop a clear Project position on artisanal mining;
- Undertake liaison with *soum* and *aimag* authorities to monitor any artisanal mining activities within the Project Area of Influence; and

⁴⁷ Oyu Tolgoi: Influx Risk Assessment. Barclay & Associates. October 2007.

⁴⁸ Artisanal miners operate outside of the existing legal framework that governs mining in Mongolia. The country's Government has made numerous attempts to regulate the sector, including a draft Artisanal Mining Law that failed to gain parliamentary approval and was abandoned in 2005. The Government forgoes significant tax revenues as the majority of artisanal gold is reportedly sold to *ger* shops or roving dealers for illegal export to China or South Korea. Source: World Bank, (2006) *Mongolia: A Review of Environmental and Social Impacts in the Mining Sector*, World Bank Group, Washington, D.C.

- If artisanal mining becomes an issue within the Project Area of Influence in terms of significant numbers of people being involved, consider sponsoring an NGO artisanal mining programme to constructively engage and reduce health and environmental risks to artisanal practitioners.

Impact Significance

Impacts associated with speculative artisanal mining within the Oyu Tolgoi Project Direct Area of Influence are expected to be **minor adverse**, based on their **localised** extent, **likely** probability of occurrence, and **medium-term** duration. Implementation of the entire set of mitigation measures described above will allow the residual significance of the overall impact to be reduced to **negligible**.

8.4 SUMMARY OF RESIDUAL IMPACTS

The main impacts related to the Project-induced population influx have been identified as follows:

- Growth of the population in Dalanzadgad (Omnogovi *aimag* capital) and intensification of population movements within the South Gobi region towards the existing mining centres, with a resultant pressures being placed on the critical regional infrastructures;
- Population rise within the Oyu Tolgoi Project Area of Influence and particularly in Khanbogd *soum*, leading to a disproportionately larger load on the communal infrastructure and utilities as well as a greater demand for the associated services, which specifically includes;
- Heightened pressure on the existing energy supply and power infrastructure;
- Higher demand for water provision and potential disruption to water supplies in rural areas;
- Exacerbated problems with the insufficient and inferior/undeveloped sewerage and sanitation systems;
- Acceleration of solid waste accumulation, coupled with the lack of waste collection and disposal facilities;
- Exceedance of the public health care capacity;
- Pressures on the provision of educational services and facilities, including all levels of schooling;
- Speculative influx of economic in-migrants seeking Project-related employment and a rising demand for accommodation; and
- A resumption of illicit artisanal mining activities.

Assuming the successful implementation of the appropriate mitigation measures, the residual significance of both the regional impact and adverse effects of the influx within the Project Area of Influence has been assessed as **minor adverse**.

Table 8.5 below summarises the impacts and associated mitigation measures, and assesses the significance of residual impacts of population inflow (post-mitigation).

Table 8.5: Summary of Impacts: Population Influx

Impact	(1) Receptor	(2) Phase	(3) Impact Categorisation	(4) Potential Significance	Design, Enhancement or Mitigation Measures	Management Plans, Policies and Procedures	Residual Significance
Population growth in Dalanzadgad, intraregional population movements, and increased pressure on regional infrastructures	Regional (Omnogovi <i>aimag</i>) citizens, <i>aimag</i> capital and local residents	Construction Operations	Duration Medium-Term Extent Restricted Likelihood Certain	Moderate Adverse	<ul style="list-style-type: none"> Establishment and operation of Oyu Tolgoi Local Regional Planning and Infrastructure (LRPI) unit. Participation in the Southern Gobi Regional Development Council activities, including in the coordination of in-migration, regional planning and development. Implementation of joint actions with national, <i>aimag</i> and local governments to support the improvement of regional infrastructure and to address development priorities and needs. Direct corporate investment and facilitation of partnership investments in regional infrastructure and development. 	<ul style="list-style-type: none"> Obligations under Section 4 of the Oyu Tolgoi Investment Agreement (“Regional Development”) Oyu Tolgoi Regional Development Programme A Roadmap and Action Plan for Oyu Tolgoi’s support to regional development and housing 	Minor Adverse
Speculative influx of economic in-migrants and a rising demand for accommodation	Local residents (Project Area of Influence) and Khanbogd <i>soum</i>	Construction Operations	Duration Medium-Term Extent Localised Likelihood Certain	Moderate Adverse	<ul style="list-style-type: none"> Preferential local recruitment and prioritising the local/regional workforce hire. No ‘at the gate/camp/site’ employment. Use of designated recruitment centres and prohibition of informal hiring. Broad advertising of recruitment and hiring procedures, together with jobs specifications and requirements. Minimising pressure on local housing through arranging camp accommodation for construction workforce. Khanbogd-centred housing for operations personnel. Commuting arrangements for Project’s non-local workforce (Bus-In Bus-Out/ Fly-In Fly-Out). 	<ul style="list-style-type: none"> Local/national employment obligations under the Investment Agreement Oyu Tolgoi Hiring Policy & Procedure Oyu Tolgoi Camp Policy and Code of Behaviour Khanbogd-centred Integrated Community Model Grievance Procedure Labour Management Plan Influx Management Plan 	Minor Adverse
Pressure on energy supply and power infrastructure	Local residents (Project Area of Influence) and Khanbogd <i>soum</i>	Construction Operations	Duration Medium-Term Extent Localised Likelihood Certain	Moderate Adverse	<ul style="list-style-type: none"> Use of on-site diesel generators to maintain Project’s self-sufficiency in power supply, including the accommodation camps. Provision of assistance with an upgrade of local power generation and distribution systems. Funding construction of a 35KV power transmission line to supply Khanbogd. 	<ul style="list-style-type: none"> Oyu Tolgoi Regional Development Programme Influx Management Plan 	Minor Adverse

Impact	(1) Receptor	(2) Phase	(3) Impact Categorisation	(4) Potential Significance	Design, Enhancement or Mitigation Measures	Management Plans, Policies and Procedures	Residual Significance
					<ul style="list-style-type: none"> Renovation of the district heating system under an ADB-funded development project for Khanbogd. 		
Greater demand for water provision	Local residents (Project Area of Influence) and Khanbogd <i>soum</i>	Construction Operations	Duration Medium-Term Extent Localised Likelihood Certain	Moderate Adverse	<ul style="list-style-type: none"> Monitoring of water levels and water quality in selected herder wells, and developing appropriate and prompt solutions if any problems are identified as a result of monitoring. Groundwater exploration and aquifer drilling/testing to identify alternative resources for water supply. Assessing the capacity of available groundwater reserves. Implementing a detailed design for the provision of bulk water supply to Khanbogd. 	<ul style="list-style-type: none"> Participatory Water Monitoring Programme Borehole drilling programme Influx Management Plan Water Resources Management Plan 	Minor Adverse
Increased pressure on sanitation facilities	Local residents (Project Area of Influence) and Khanbogd <i>soum</i>	Construction Operations	Duration Medium-Term Extent Localised Likelihood Certain	Moderate Adverse	<ul style="list-style-type: none"> Operating a self-contained tertiary wastewater treatment plant on-site. Supporting the development of reticulated sewerage system and treatment in ponds. Transfer of sequencing-batch reactor sewage treatment plants from Project temporary construction camps to Khanbogd after camps closure. 	<ul style="list-style-type: none"> Influx Management Plan Waste Management Plan 	Minor Adverse
Overloading of solid waste collection and disposal	Local residents (Project Area of Influence) and Khanbogd <i>soum</i>	Construction Operations	Duration Medium-Term Extent Localised Likelihood Certain	Moderate Adverse	<ul style="list-style-type: none"> Operation of interim waste management facility during Project construction. The use of a dedicated Waste Management Centre for Project operations. Waste recycling during Project construction and operations. Supporting the development of a waste collection system and the landfill for Khanbogd <i>soum</i> centre, jointly with the Government and ADB. 	<ul style="list-style-type: none"> Influx Management Plan Waste Management Plan 	Minor Adverse
Increased load on the public health care capacity	Local residents (Project Area of Influence) and Khanbogd <i>soum</i>	Construction Operations	Duration Medium-Term Extent Localised Likelihood Certain	Moderate Adverse	<ul style="list-style-type: none"> Doctor scholarship programme. Establishment of Health Consultancy Centres. Establishment of a dental surgery in Khanbogd. Establishment of a trauma centre at Javkhlant <i>bagh</i>. Assessing the capacity of health organisations and service outreach in the Project Area of Influence. 	<ul style="list-style-type: none"> Health Impact Assessment Influx Management Plan Community Health, Safety and Security Programme Community Health, Safety & Security Management 	Minor Adverse

Impact	(1) Receptor	(2) Phase	(3) Impact Categorisation	(4) Potential Significance	Design, Enhancement or Mitigation Measures	Management Plans, Policies and Procedures	Residual Significance
					<ul style="list-style-type: none"> Monitoring of disease incidence. 	<ul style="list-style-type: none"> Plan Emergency Response Plan 	
Rising pressures on educational services and facilities	Local residents (Project Area of Influence) and Khanbogd <i>soum</i>	Construction Operations	Duration Medium-Term Extent Localised Likelihood Certain	Moderate Adverse	<ul style="list-style-type: none"> Implementation of vocational/professional training and apprenticeship programmes, as well as the award of graduate scholarships. Co-financing of school extension in Khanbogd jointly with the Government. Construction of extension to the kindergarten in Khanbogd. Refurbishment of five existing technical and vocational (TVET) colleges and the establishment of two new TVET colleges in Dalanzadgad and Nalaikh. 	<ul style="list-style-type: none"> Training requirements under the Investment Agreement Oyu Tolgoi 5-Year Training Strategy and Plan Labour Management Plan Influx Management Plan 	Minor Adverse
Recurrence of illicit artisanal mining activities	Local residents (Project Area of Influence) and Khanbogd <i>soum</i>	Construction Operations	Duration Medium-Term Extent Localised Likelihood Likely	Moderate Adverse	<ul style="list-style-type: none"> Further investigation of artisanal mining activities in the Oyu Tolgoi area to identify locations, level of participation, and extent of environmental and health risks associated. Inclusion of artisanal miners as one of the target groups in Project-sponsored Communicable diseases/ HIV/AIDS prevention programme. 	<ul style="list-style-type: none"> Influx Management Plan Community Health, Safety & Security Management Plan 	Minor Adverse

Notes:

(1) Receptors: Defines the Affected or Other Interested Parties

(2) Project Phase: Construction, Operations, Decommissioning and Mine Closure

(3) Impact Categorisation:

Duration: Short-term, Medium-term, Long-term

Extent: Highly Localised; Localised; Restricted; Widespread

Likelihood: Highly Unlikely; Unlikely; Likely; Certain

(4) Potential Significance: Major Adverse; Moderate Adverse; Minor Adverse; Negligible; Positive