

## SECTION C: IMPACT ASSESSMENT

### CHAPTER C10: LAND USE & DISPLACEMENT

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## 10 LAND USE & DISPLACEMENT IMPACT ASSESSMENT

### 10.1 INTRODUCTION

This Chapter of the ESIA describes potential impacts on land use associated with the construction, operational and decommissioning phases of the Oyu Tolgoi Project. The Chapter considers impacts on directly affected parties (rural herders) together with indirectly affected land users in Khanbogd *soum*. Land use impacts are considered both for direct land take (to allow for the construction of the mine and associated facilities) in addition to indirect impacts associated with restricted access to land or services provided by the land (grazing, water supply and pasture etc).

The Chapter also reflects the concerns raised by local communities during various consultation rounds on the Project. As the Oyu Tolgoi Project is already in the advanced stages of construction, most impacts have already taken place for which mitigation measures have been employed. Long-term management and monitoring measures are described in *Chapter D15: Resettlement Action Plan*.

### 10.2 SCOPE OF THE ASSESSMENT

#### 10.2.1 Definitions

Impacts are considered for both physical and economic displacement as defined by IFC Performance Standard 5 (PS5) 'Land Acquisition and Involuntary Resettlement', and EBRD Performance Requirement 5 (PR5) 'Land Acquisition and Involuntary Resettlement':

- *Physical displacement*: occurs if people living in the Project Area must move to another location<sup>1</sup>, as a result of land acquisition or use by the Project;
- *Economic displacement*: occurs where land acquisition for the Project causes a loss of or impediment of access to an economic asset, thereby affected livelihoods<sup>1</sup>; and
- Project activities that cause *disruption to economic activities*, in this case, disruption to herding activities of herder families located nearby to Project facilities during the temporary but intensive construction period.

#### 10.2.2 Spatial Scope

The assessment covers land acquisition and land use by the Project within Khanbogd *soum*. Specifically, the assessment is focused on the physical footprint of the Project and covers the Mine Licence Area and residential Exclusion Zone, the Gunii Hooloi borefield and water supply infrastructure, the permanent and temporary airport sites, as well as the transport and infrastructure corridor from Oyu Tolgoi to Gashuun Sukhait border crossing point with China.

#### 10.2.3 Temporal Scope

The temporal scope covers the life of mine (estimated at 27 years) and post-mine legacy. Impacts are discussed for the construction, operational and post-closure phases of the Project.

## 10.3 IMPACT ASSESSMENT

### 10.3.1 Summary of Impacts

Displacement impacts arising from the construction, operation and closure phases of the Project are as follows:

- Total physical displacement of herder households from the Mine Licence Area and displacement of winter camps from a 10km Residential Exclusion Zone around the Mine Licence Area;

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<sup>1</sup> International Finance Corporation's (IFC) Guidance Notes: Performance Standards on Social & Environmental Sustainability. Guidance Note 5 'Land Acquisition & Involuntary Resettlement' [July 2007].

- Economic displacement of herders affected by reduced access to and/or loss of summer pastures due to land take for the airport sites;
- Division of pastures caused by the construction of linear Project components (including the Oyu Tolgoi to Gashuun Sukhait Road and the water supply pipeline (construction corridor));
- Disruption to herding activities;
- Loss of wells and other impacts to water availability/quality (e.g. impeded access to wells); and
- Overall reduction of pastureland in Khanbogd *soum* leading to increased competition for grazing and over use of remaining grazing land.

### 10.3.2 Project Land Requirements

Oyu Tolgoi will require land to construct and operate the Project. Around 10,500 hectares (ha) of land will be required for the mine site and ancillary facilities. This includes land for the Mine Licence Area that was granted in 2009, additional land required for the TSF, concentrator and batch plant, the new domestic airport and planned permanent airport, the Gunii Hooloi borefield and water pipeline, and the transport/infrastructure corridor between Oyu Tolgoi and Gashuun Sukhait at the Chinese border. Land will also be temporarily disturbed during the construction phase for activities such as the installation of worker construction camps, excavation of borrow pits and soil stripping of the water pipeline and transmission line corridors. *Table 10.1* below presents the Project land requirements.

*Figure 10.1* illustrates the location of the construction camps relative to the Oyu Tolgoi mine.

**Table 10.1: Summary of Project Land Requirements**

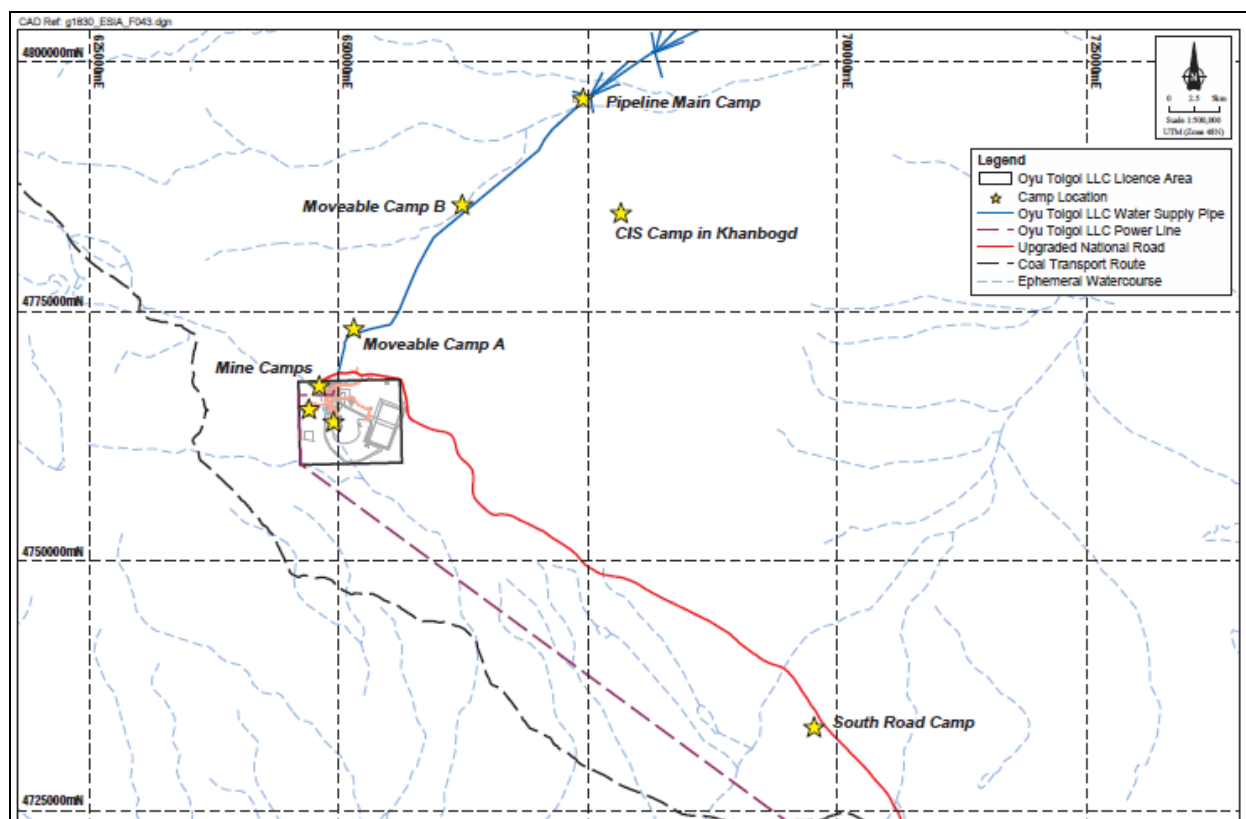
#	Land Requirements	Component	Area /ha/	Perimeter /km/	Comment
1	Mine Licence Area <sup>2</sup>	Original licence area	8494.43	37.053	Number 6709 Mine Licence Area
		TSF area	64.43	5.265	Additional area for tailings storage facility cell 2
		Concentrator area	20.34	2.100	Additional area for concentrator load-out area
		Batch plant #1	44.91	2.843	Additional area of batch plant #1
2	Airport Sites	Temporary airport	46.45	5.388	Permitted land use area / fenced area
		Permanent airport	229.86	9.199	Permitted land use area
3	Water Supply Pipeline	Pipeline land limit area	891.70	293.931	Total area is included: Maintenance road is 5 meters wide and drainage line is 5 meters, 35 kV power line, 2 storage lagoons (approx. 320,000m <sup>2</sup> ), 28 wells (approx. 500m <sup>2</sup> ), 5 pump stations (approx. 2,500m <sup>2</sup> ) and 1 break tank pump station (approx. 11,000m <sup>2</sup> ). RWSS Pipeline will be buried.
4	Power Transmission Line	220kV transmission line	50.68	168.955	6 meters wide maintenance road from south west corner of lease area to China border
5	Roads	Oyu Tolgoi to Gashuun Sukhait road	219.13	183.366	Average width of topsoil to be removed is 24 meters
		Oyu Tolgoi to Khanbogd road	39.79	79.592	10 meters wide road from north gate of mine site to Khanbogd <i>soum</i> centre
		Road to permanent airport	4.72	9.478	Road area estimated from crossing of temporary airport road
		Road to temporary airport	5.08	10.262	Road area estimated from crossing of Khanbogd road
6	Temporary Construction Camps and Plant	North camp	46.99	3.301	Main camp for pipeline construction
		Camp A	22.73	1.912	For pipeline phase 1 construction
		Camp B	22.73	1.912	For pipeline phase 1 construction
		Ger camp B	20.00	1.800	For pipeline phase 2 construction

<sup>2</sup> Some further land is required in addition to the original Mine Licence Area to fully accommodate the TSF, concentrator and batch plant. Permission for these additional land requirements has been sought by Oyu Tolgoi and approved by the *soum* government.

#	Land Requirements	Component	Area /ha/	Perimeter /km/	Comment
		South camp	24.88	1.995	For road and transmission line construction
		Khanbogd camp (also known as CIS camp)	6.56	1.017	Camp is located in Khanbogd <i>soum</i> centre
		Rock crusher & Asphalt plant 1	10.09	1.306	For Oyu Tolgoi to Gashuun Sukhait road construction
		Rock crusher & Asphalt plant 2	1.99	0.599	For Oyu Tolgoi to Gashuun Sukhait road construction
		Rock crusher & Asphalt plant 3	10.05	1.414	For Oyu Tolgoi to Gashuun Sukhait road construction
7	Borrow Pits and Quarry Areas	Borrow pits	91.37	22.148	All approved and proposed borrow pits out of mine site
		Quarries	43.61	9.205	All approved and proposed quarries out of mine site
<b>Total Area</b>			<b>10,412.51</b>	<b>854.04</b>	

Source: Oyu Tolgoi, October 2011, based on GIS assessment.

**Figure 10.1: Location of Construction Camps Relative to the Oyu Tolgoi Mine**



### 10.3.3 Identification of Displacement Impacts and Impact Zones

Oyu Tolgoi has carried out detailed assessments<sup>3</sup> of land use, pastureland quality, and water availability and use throughout Khanbogd *soum* to characterise the areas affected by land take (physical displacement) and indirect land use impacts (economic displacement). Through the detailed work described above, Oyu Tolgoi has been able to identify and map a series of different “impact zones” (see below) which describe the relationship between the Project and affected parties; these zones have now been agreed by community consensus and have been used to determine community and household-level entitlements for livelihood restoration and other assistance.<sup>4</sup>

#### **For Physical Displacement**

Increased activity in and around the Oyu Tolgoi Project site from 2002 onwards led to the emergence of minor issues that were indicative of potential future conflicts, e.g. increasing non-herder settlements within and surrounding the Oyu Tolgoi Project Area that were impacting the livelihood of local herders with increased rubbish, traffic, pastureland and water use.

The key methods for identifying physical displacement impacts involved consultation and surveys of all herders nearby to the Mine Licence Area, as well as environmental studies, as follows:

- *Initial community consultation programme:* Commenced in February 2003 in coordination with the Oyu Tolgoi Environment Department, *soum* authorities and neighbouring herders. The aim of the consultation was to determine how to manage human occupation of land directly and indirectly

<sup>3</sup> These assessments are described in detail in the Methodology sections of *Chapter B6: Water Resources Baseline* and *Chapter B10: Land Use Baseline*.

<sup>4</sup> Note: the impact zone for the Mine Licence Area and exclusion zone had already been defined by the earlier resettlement process completed in 2005.

impacted by the Oyu Tolgoi Project, and minimise impacts to neighbouring herders as a result of influx and future potential environmental issues associated with mine development.

- *Oyu Tolgoi Project Environmental Impact Assessment (EIA), Volume 3 Mining and Processing, Eco-Trade LLC 2006.*<sup>5</sup> Environmental studies were conducted as part of the EIA process to quantify potential environmental impacts that could occur as a result of the Project. Hydrogeological reports concluded that shallow water resources outside the Mine Licence Area could be affected from the draining of the open pits during the life of the mine. Predictions of dust emissions from the tailings facility also showed potential wind-blown dust extending beyond the mine boundary.
- *Census of potentially affected herder households:* In June 2003, Oyu Tolgoi commissioned a census of all households within a 20km radius of the Oyu Tolgoi mine exploration camp. Households were surveyed to obtain data on land use, land entitlements and household assets (mostly livestock). A total of 15 households (91 people) were involved in this survey.

Initial studies were undertaken between 2004 and 2006 to assess the potential impact of the pit and underground mine on the groundwater, using limited hydrological data available, to provide Oyu Tolgoi with an assessment of the worst case water inflows to the pit and assess the area of influence. The modelling used a number of scenarios, which took account of the possibility of subsidence around the underground block caving which could cause the surficial groundwater to flow into the block caving. These models, which used conservative assumptions (e.g. no internal flow barriers and just four modelled units – alluvial, soil, weathered bedrock and bedrock), predicted an ellipsoid cone of depression which was approximately 10 km by 8 km for the 1 m drawdown contour. The 1 m contour was, given the conservative nature of the model, taken as equivalent to the zero drawdown contour as it was considered to overestimate the extent of any zone of influence of the pit dewatering. This initial information along with other factors, such as anticipated dust emissions, was used to define the 10 km zone designated for herder relocation (from herder winter camps but not temporary summer grazing<sup>6</sup> which is transient and the location of which cannot be directly controlled by the Project).

Since this initial modelling there have been a significant number of additional boreholes drilled, including those used for the construction water supply, which has provided a better appreciation of the layering of the sediments and their relative hydraulic conductivities. Oyu Tolgoi has commissioned a revision of the groundwater model for the mining licence which will include hydraulic testing on the various formations and other geotechnical testing. This work is underway and a new model will be developed in 2012. As an interim step the original simplistic model has been revisited and re-run using more realistic (lower) hydraulic conductivities based on recent data gathered from the Mine Licence Area.

This re-run of the model predicted a smaller cone of depression, with the 1 m drawdown contour being approximately 5 km from the mine at the end of the open pit mining extending beneath the WRD and a section of the Undai and its diversion, and the majority of the TSF. The 1 m drawdown contour in the interim model is also used as an approximation to the maximum drawdown contour as the data used in this model is insufficient to refine the outer edge of the groundwater area with greater confidence. Within this area there are no other groundwater users such as herders or springs (other than the Bor Ovoo) or any groundwater dependent flora (see *Chapter B7A: Biodiversity Baseline*).

It is anticipated that when further layers are put in the model in 2011, together with more representative hydraulic conductivities, the modelled cone of depression will be smaller in extent and irregular in shape and therefore will better reflect the local geology and structures in the Mine Licence Area. This will provide Oyu Tolgoi with a higher degree of confidence in the model which is being used to evaluate the potential impacts of the drawdown on the different aquifers, including the wider spread weathered and fractured bedrock aquifer, and the linear aquifers associated with the ephemeral watercourses.

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<sup>5</sup> Eco Trade LLC (2006), Oyu Tolgoi Project Detailed Environmental Impact Assessment, Volume 3 – Report for the Oyu Tolgoi Project Mining and Processing, May 2006.

<sup>6</sup> Summer grazing is conducted by about 40% of herders for about 4 months of the year, and usually includes around 5-6 moves (see *Chapter B10: Land Use Baseline*). Therefore the amount of time any herder family might spend in or near the exclusion zone for summer grazing would be limited, compared with being a permanent resident.

Importantly the revised groundwater model in 2012 will enable Oyu Tolgoi to review critically the area of influence of the cone of depression and verify that impacts will not extend to any of the herders around the Mine Licence Area; Oyu Tolgoi will present this data to the herding community through the various forums such as the participatory environmental monitoring programme.

### ***For Economic Displacement***

Oyu Tolgoi's approach to identifying economic displacement impacts has been through open and regular consultation with herders in Khanbogd *soum*. This has included consultation with all herders known to frequent an area, both those with winter shelters and therefore established user rights, and others who may only visit the area on occasion. Since pastureland is communal property (by law), every member of the herding community has equal access to use it for grazing livestock.

In Khanbogd *soum*, pastoralists have largely developed their own system of managing and controlling their pastures. Herders have traditional grazing rights to pastureland at their winter shelter sites, which acts as an informal pastureland management system. Summer grazing is also conducted informally, and there are no designated summer pasture areas in the *soum* (these change from year to year depending on forage quantity, livestock numbers, weather conditions and individual herder family requirements).

Since 2007 Oyu Tolgoi has undertaken a series of studies and consultation rounds to clarify the situation with regards to pasture use and to understand better the interactions between herder communities and the Project. The key elements for identifying economic displacement impacts are as follows:

- *Initial herder land use and water studies:* Between 2007 and 2008 Oyu Tolgoi conducted several investigations into herder land use and water use in the *soum*. These included a *Water Perception Study in Khanbogd Soum (2007)* with 280 herder households, where wells and shelters were mapped, and livestock numbers and other key data gathered, a *Water Use Study, 2008* with 21 herder families around the Gunii Hooloi borefield area, and various other herder well monitoring and mapping activities being undertaken by the Environment Department.
- *Pastureland mapping and assessment:* Oyu Tolgoi initiated a programme to build on the initial investigations and specifically identify herders using pastures around the different Oyu Tolgoi Project sites. The main goal was to understand grazing land boundaries, pastureland management arrangements, and to identify herder families. Oyu Tolgoi visited each herder household, conducted semi-structured interviews and drew seasonal pastureland area boundaries on an area map with the herders.
- *Detailed consultation with all potentially affected herder households:* In mid-2010, Oyu Tolgoi began detailed consultation with potentially affected herders. A series of meetings were held with herder communities in each *bagh* to discuss potential economic displacement impacts and possible livelihood restoration and assistance measures for affected herders. Household visits with selected herders were also conducted to discuss land disturbance and related impacts in each area.
- *Survey of Potentially Affected Herder Households, 2010 to 2011:* This survey was undertaken by Oyu Tolgoi between September 2010 and May 2011. This survey involved detailed household visits to all potentially affected herder families. A total of 84 households were involved in this consultation and survey programme to gather socio-economic data, and to consult people about the potential impacts to their pastures, wells and herding practices in each area.
- *Establishment of the Compensation Working Group:* In March 2011, it was agreed that a working group of the potentially affected, *soum* authorities and Oyu Tolgoi would be established to facilitate consultation with herders and agree the impact zones for each Project facility and the proposed entitlements for the different displacement impacts. The Working Group was established in April 2011, with eleven members. The group has met approximately monthly since May 2011 (see *Chapter D15: Resettlement Action Plan* for further details).

Results from these investigations and consultation identified that there is considerable variation between herder households in terms of their migration patterns, herd size, family size and overall standards of living. It also highlighted that there are no clear boundaries for summer and autumn grazing areas, and that these vary from year to year, and from household to household, making it difficult to be firm about where infrastructure can best be placed to minimise inconvenience and disruption to herding practices. Herders agreed that whilst grazing land is communal property, there are some households that will be directly impacted by land acquisition and Project activities.

Negotiations on the “impact zones” for economic displacement have been ongoing with the Compensation Working Group and affected herder households since May 2011. Initial zones were agreed during a meeting of the Compensation Working Group on 5 May 2011. Since that time, further meetings of the Compensation Working Group, as well as individual negotiations with affected households has resulted in some minor revisions to these zones. The proposed revision of the impact zones was raised at the 21 September 2011 meeting of the Working Group, and a final decision was reached on the impact zones in the 17 October 2011 meeting.

These impact zones for each of the Oyu Tolgoi Project components are described in *Table 10.2* and illustrated in *Figure 10.2* and *Figure 10.3*. As shown by *Figure 10.2*, within the agreed impact zones there are some additional sub-zones highlighted (e.g. for the airport and road infrastructure). These simply designate where some affected households are entitled to a higher contribution towards their individual livelihood support packages; the types of impacts and all other entitlements in these zones are the same (see *Chapter D15: Resettlement Action Plan* for details).

For the Gunii Hooloi Borefield and pipeline, the impact has been categorised into two phases to differentiate between the extent of impact to the herders and define appropriate impact zones for each phase. The Water Pipeline Phase 1 will require land disturbance from a single pipeline, whereas Water Pipeline Phase 2 will require more intensive ground disturbance with supplementary pipelines from each borehole, pumps stations and water storage lagoons. This is further discussed in *Section 10.3.5* below.

**Table 10.2: Summary of Displacement Impacts and Impact Zones**

Project Site / Facility / Area	Source of Impacts	Displacement Impact / Loss of Resource	Impact Zones
<b>A. Mine Site Area<sup>7</sup></b>	<ul style="list-style-type: none"> <li>The Mine Licence Area requires large open pit mine, shafts, construction camps and administrative areas and will be permanently fenced off, and herder access to grazing land prohibited due to safety hazards.</li> <li>In addition, the 10km exclusion zone is established around Mine Licence Area to prohibit winter camps, but grazing and summer camps remain permitted.</li> </ul>	<p><b>Physical displacement/resettlement (A1):</b></p> <ul style="list-style-type: none"> <li>Resettlement outside of the Mine Site Area of all herder households having winter camps therein.</li> <li>Loss of 8,625 hectares of pasture land located inside the fence of the Mine Licence Area (see <i>Table 10.1</i>).</li> </ul>	A1 All herder households with winter shelters in the <b>Mine Site Area</b> as at the officially notified cut-off date, 28 January 2004.
<b>B. Airport Sites</b>	<ul style="list-style-type: none"> <li>Earthworks and associated activities will cause noise and dust during construction.</li> <li>The Airport Sites require airstrip and associated buildings and will be permanently fenced off, and herder access to grazing land prohibited due to safety hazards.</li> <li>Air traffic may cause some noise during operations.</li> </ul>	<p><b>Economic displacement: loss of summer pastures (B1, B2):</b></p> <ul style="list-style-type: none"> <li>Temporary disturbance of 46 hectares of pasture land for temporary airport; rehabilitated afterwards.</li> <li>Loss of 230 hectares of pasture land located inside the fence of the permanent Airport Site.</li> <li>Economic displacement due to partial loss/reduction of access to summer grazing land.</li> <li>Minor noise impacts due to operation of airports.</li> </ul>	<p>B1 All herder households with winter shelters <b>within 5km</b> of the Airport Sites and with traditional grazing land rights in the area.</p> <p>B2 All herder households with winter shelters<sup>8</sup> <b>within 5-11km</b> of the Airport Sites and with traditional grazing land rights in the area.</p>
<b>C. Oyu Tolgoi to Gashuun Sukhait Road Corridor</b>	<ul style="list-style-type: none"> <li>Topsoil stripping and presence of people and equipment will disturb pasture land.</li> <li>Earthworks and associated activities will cause noise and dust during construction.</li> <li>Heavy vehicle traffic presents permanent hazard to livestock and people crossing road.</li> </ul>	<p><b>Division of permanent pastures (C1):</b></p> <ul style="list-style-type: none"> <li>Loss of approximately 220hectares of pasture land for the road construction/upgrade.</li> <li>Severe noise and dust during construction and hazards from equipment and people.</li> <li>Division of permanent pastures as a result of operation of the road (and increased traffic).</li> </ul>	C1 All herder households with winter shelters <b>within 500m</b> either side of the Oyu Tolgoi to Gashuun Sukhait Road.

<sup>7</sup> The Mine Site Area includes the Mine Licence Area and the 10 km residential Exclusion Zone.

<sup>8</sup> Both winter and spring shelters provide a legal basis for obtaining a certificate for land. Most herders have winter shelters or camps, only a few have spring shelters. As no dwellings were being lost due to the mine's construction activities, and there was therefore no reason for replacing spring shelters, the compensation working group and affected herders agreed during compensation consultations that winter shelters would be used as the basis for determining eligibility in a compensation category.

Project Site / Facility / Area	Source of Impacts	Displacement Impact / Loss of Resource	Impact Zones
	<ul style="list-style-type: none"> <li>Road shoulders and road may present barrier to animals crossing road.</li> </ul>	<ul style="list-style-type: none"> <li>Severe disturbance due increasing traffic on road and associated safety hazards.</li> </ul> <p><b>Disruption to herding practices (C2):</b></p> <ul style="list-style-type: none"> <li>Changes to migration patterns to avoid road; potential overgrazing of some areas/conflicts with neighbours.</li> <li>Minor to moderate noise and dust during construction.</li> <li>Potential ongoing noise and safety issues during operation of road due to traffic.</li> </ul>	<p>C2 All herder households with winter shelters <b>within 500m - 6.5km</b> either side of the Oyu Tolgoi to Gashuun Sukhait Road.</p>
<b>D. Gunii Hooloi Water Pipeline &amp; Transmission Line from China*</b>	<ul style="list-style-type: none"> <li>Topsoil stripping, open trench for pipeline / borefield and presence of people and equipment will disturb pasture land.</li> <li>Topsoil stripping for transmission line and presence of people and equipment will disturb pasture land.</li> <li>Earthworks and associated activities will cause noise and dust.</li> <li>Boreholes/pumps, transmission tower foundation pads, single track maintenance route of approx. 3.5 m width along each facility.</li> </ul>	<p><b>Division of permanent pastures (D1):</b></p> <ul style="list-style-type: none"> <li>Temporary disturbance of pasture land due to topsoil stripping and related construction activities.</li> <li>Division of pastures as a result of open trench and heavy equipment.</li> <li>Severe noise and dust during construction and hazards from equipment and people.</li> </ul>	<p>D1 All herder households that have winter shelters within:</p> <ul style="list-style-type: none"> <li><b>1km</b> either side of the Water Pipeline Phase 1 OR Transmission Line.</li> <li><b>3km</b> either side of the Water Pipeline Phase 2.#</li> </ul>
		<p><b>Disruption to herding practices (D2):</b></p> <ul style="list-style-type: none"> <li>Disruption to herding practices, greater time tending herd to avoid hazards.</li> <li>Minor to moderate noise and dust during construction.</li> </ul>	<p>D2 All herder households that have winter shelters within:</p> <ul style="list-style-type: none"> <li><b>1km-2km</b> either side of the Water Pipeline Phase 1 OR the Transmission Line.</li> <li><b>3-7km</b> either side the Water Pipeline Phase 2.</li> </ul>
<b>E. Summer Grazing in Khanbogd Soum</b>	<ul style="list-style-type: none"> <li>Fencing off of the Mine Licence Area, Airport Sites.</li> <li>Construction and operation of Oyu Tolgoi to Gashuun Sukhait Road, GH Water Pipeline and Borefield, and Transmission Line.</li> </ul>	<p><b>Communal grazing land loss(E1):</b></p> <ul style="list-style-type: none"> <li>Loss of up to approx. 10,500 hectares for Oyu Tolgoi Project facilities, including temporary disturbance of land during construction.</li> <li>Local herders no longer have access to this land; thus increasing competition for grazing resources, potential conflicts, overgrazing, etc.</li> </ul>	<p>E1 All seasonal herder households with traditional grazing use rights in Khanbogd <i>soum</i>.</p>
<b>F. Unoccupied Winter Shelters (All Impact Zones)</b>	<ul style="list-style-type: none"> <li>Construction activities in all areas could restrict access to unoccupied winter shelters (if herders now residing in <i>soum</i> centre visit).</li> </ul>	<p><b>Non-resident winter shelter owners affected by cumulative impacts (F1)</b></p> <ul style="list-style-type: none"> <li>Non-resident winter shelter owners, who relocated out of the impact zone due to cumulative impacts of Tsagaan Khad truck stop.</li> </ul>	<p>F1 Oyu Tolgoi to Gashuun Sukhait Road Impact Zone in vicinity of Tsagaan Khad.</p> <p>F2 All herder households with unoccupied winter shelters in one of</p>

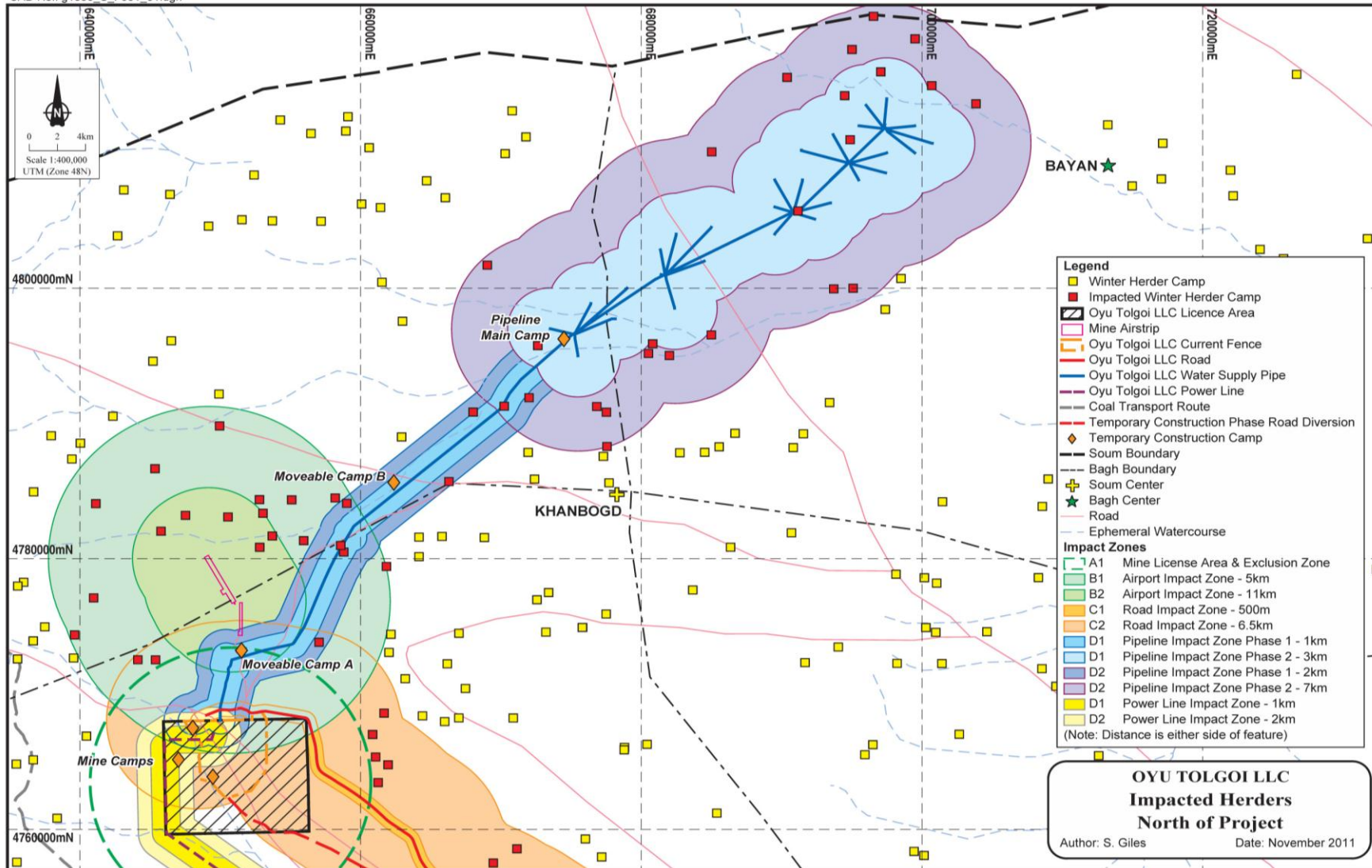
Project Site / Facility / Area	Source of Impacts	Displacement Impact / Loss of Resource	Impact Zones
		<b>Disruption to herding practices (F2):</b> <ul style="list-style-type: none"> <li>▪ Unoccupied winter shelters unlikely to experience direct disruption, but Oyu Tolgoi recognise they have property rights and may be affected by construction when they visit their shelters.</li> </ul>	the agreed impact zones.
<b>Additional impacts** (All Impact Zones)</b>	<ul style="list-style-type: none"> <li>▪ Construction activities and location of permanent facilities, e.g. road will restrict access to wells for some herders.</li> <li>▪ Double impacts (households in overlapping impact zones).</li> </ul>	<b>Additional impacts to already affected herders:</b> <ul style="list-style-type: none"> <li>▪ Loss of/restricted access to wells during construction and/or operations.</li> <li>▪ Seven households are affected by impacts from more than one impact zone so will receive additional compensation.</li> </ul>	All seasonal herder households affected by well/water impacts. All households affected by more than one category of impact.

<sup>#</sup> Note: Phase 1 of the Gunii Hooloi Water Pipeline and Borefield refers to the linear Pipeline route from the mine site to the Borefield. Phase 2 refers to the Borefield, including supplementary pipelines coming from the main pipeline to each borehole (see Figure 10.4). These definitions have been derived from consultation with herders residing/grazing in the vicinity of the Pipeline and Borefield area in 2011 (they do not relate to the construction process). During consultation it was identified that pipeline and wells/pump stations/lagoons in the Borefield area (Phase 2) would result in different land disturbance and disruption to herders than construction of the linear pipeline (Phase 1). Therefore, these impact zones are different in order to align with the actual displacement impacts to herders.

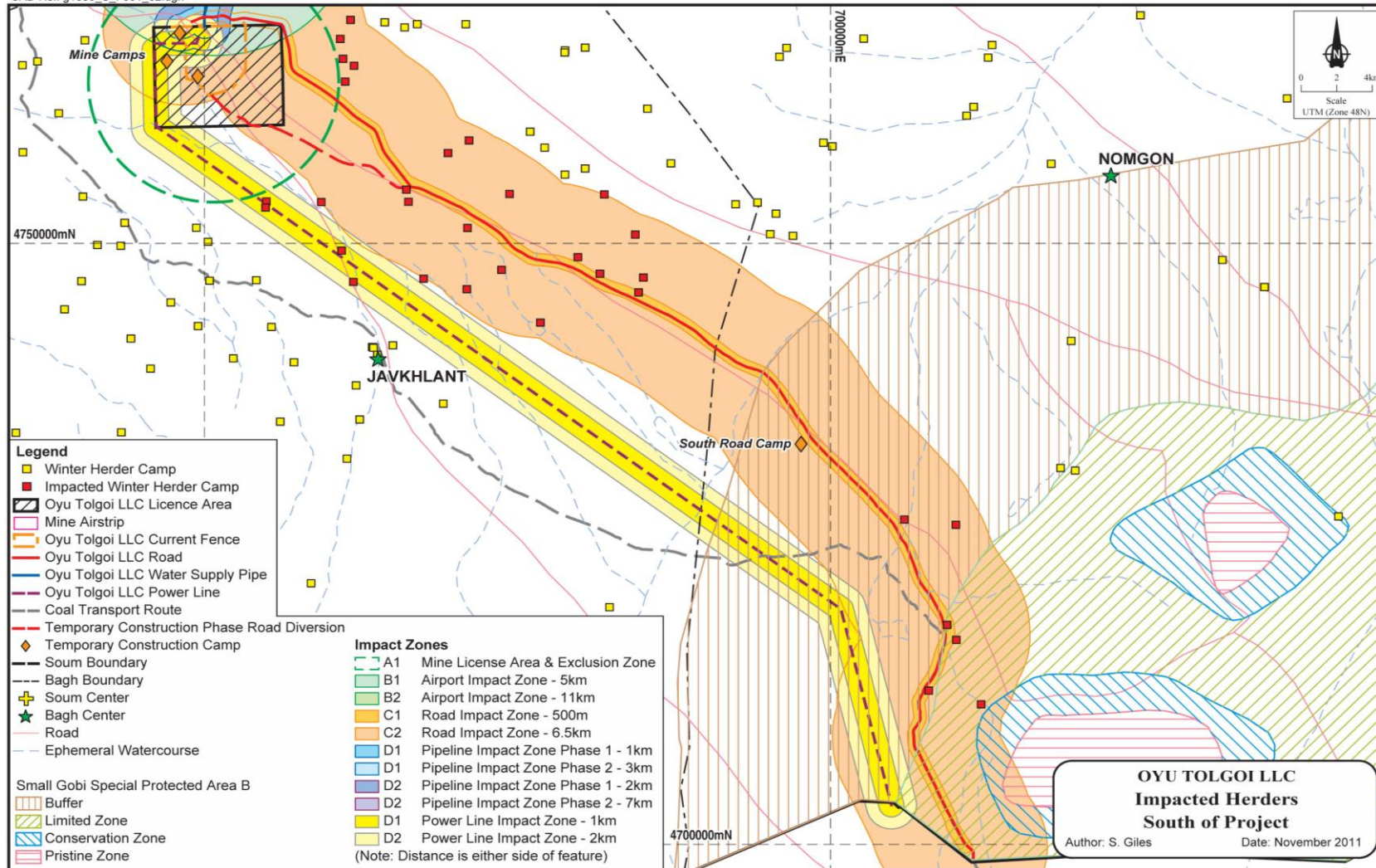
\* The transmission line and water pipeline and borefield HHs were grouped as they are impacted in a similar way (i.e. construction phase disturbance and small permanent on ground features).

\*\* Households are already enumerated in other impact categories.

Figure 10.2: Impact Zones and Winter Shelters (North)



**Figure 10.3: Impact Zones and Winter Shelters (South)**



Note: Due to scale these figures are illustrative only. Some of the winter shelters that appear on or very close to infrastructure are actually several hundred metres or more than 1km away on the ground.

### 10.3.4 Project Affected People

Table 10.3 below shows the households impacted by land acquisition, use, or disturbance in each of the impact zones. A total of **10 households (16 families, 61 people)** have already been **physically resettled**, and a total of **84 households, 325 people** are being and/or will be **economically displaced**. A total of **94 HHS** are considered to be directly affected by the Project.

**Table 10.3: Summary of Project Affected People (Herder Households)**

Component <sup>#</sup>	Physically Displaced	Economically Displaced or Disrupted by Project Activities
<b>A. Mine Site Area</b> (Mine Licence Area & Exclusion zone)	A1. <b>10 HHS</b> (16 herder families, 61 people) affected by displacement of winter shelters in Mine Licence Area were relocated in 2005.	Captured in Category E1. (See the note in Section 10.3.11).
<b>B. Airport Sites</b>	None.	B1. <b>7 HHS</b> with winter shelters within 5 km of airport who will experience partial loss/reduction of access to summer grazing land. B2. <b>15 HHS</b> with winter shelters within 5-11 km of airport who will experience minor reduction/reduced choice of summer pastures.
<b>C. Oyu Tolgoi to Gashuun Sukhait Road Corridor</b>	None.	C1. <b>4 HHS</b> with winter shelters within 500m either side of Oyu Tolgoi to Gashuun Sukhait road who will be divided from pastures and impacted by construction and operation of the road. C2. <b>14 HHS</b> with winter shelters between 500m and 6.5km either side of the Oyu Tolgoi to Gashuun Sukhait road that will have their migration routes/herding practices disrupted by construction and road activities.
<b>D. Gunii Hooloi Pipeline &amp; Transmission Line from China</b>	None.	D1. <b>11 HHS</b> with winter shelters within 1km either side of the Water Pipeline Phase 1 or Transmission Line, and 3km from the Water Pipeline Phase 2, that will have their pastureland temporarily divided by the pipeline trench and have their migration routes/herding practices disrupted by construction activities. D2. <b>11 HHS</b> with winter shelters within 1km to 2km either side of the Water Pipeline Phase 1 or Transmission Line, and 3-7km from the Water Pipeline Phase 2, that will have their migration routes/herding practices disrupted by construction activities.
<b>E. Summer Grazing in Kanbogd Soum</b>	None.	E1. All seasonal herders (an estimated 399 households) in Khanbogd <i>soum</i> could be affected by an overall reduction in the availability of pastureland.**
<b>F. Other* (All Impact Zones)</b>	None.	F1. <b>4 HHS</b> (non-resident winter shelter owners), who relocated out of the impact zone due to cumulative impacts of Tsagaan Khad truck stop. F2. <b>18 HHS</b> (non-resident winter shelter owners), who reside in the <i>soum</i> centre but have winter shelters in one of the above impact zones, who may experience restrictions in access or nuisance dust, noise impacts if they access their shelters during the construction phase.
<b>Total</b>	<b>10 HHS</b>	<b>84 HHS</b>

HH = Household; <sup>#</sup> Category letters refer to the identifiers given in the Summary of Displacement Impacts and Impact Zones.

\* There are four households affected by loss or restriction of access to water; these households are affected in other categories so are not specifically noted in the table (see Section 10.3.10). All impacted water supplies will be restored.

\*\* Oyu Tolgoi recognises that seasonal herders in the soum could potentially be affected by a reduction of grazing land – this is a communal or shared loss. This is not the same as economic displacement of individual herders, but recognition by Oyu Tolgoi that reduced overall land could increase competition for grazing resources, create potential conflicts, and/or result in overgrazing which could affect seasonal herders (see Section 10.3.11).

*Impact Categories B2, C2, and D2: For the outer impact zones for the Airport (B2), Oyu Tolgoi to Gashuun Sukhait Road (C2) and Water Pipeline Phase 2 (D2), Oyu Tolgoi created several sub-categories through recent negotiations with herders and an independent legal advisor (these sub-categories are addressed fully through the Entitlements Matrix (D15) and are as follows: B2 (A) 5 – 8 km; B2 (B) 8 – 11 km; C2 (A) 500m – 3.5 km; C2 (B) 3.5 – 6.5 km; D2 (A) 3 – 5 km; D2 (B) 5 – 7 km. For the purposes of the affected people summary table, only the top level category is included.*

### 10.3.5 Efforts to Avoid and Minimise Displacement

All components of the Oyu Tolgoi Project are in a sparsely populated rural area. Oyu Tolgoi has avoided, as far as practically possible, resettlement of herder winter shelters, and economic displacement due to loss of grazing land or disruption to herding practices at a number of stages throughout the Project development process.

#### *Mine Site Area*

As described above, the Mine Site Area, including the 10km Exclusion Zone was proposed based on extensive consultation and predictions of environmental impacts conducted for the EIA process. The exclusion zone was initially suggested as 20km by the soum authorities, but was later requested as 10km by Oyu Tolgoi in order to minimise the number of herders resettled as a result of the Project.

#### *Fence Extension Area*

The initial area required for the mine site was fenced in 2005 (approximately 5km<sup>2</sup>) and the public was then excluded from inside the fence. However, in order to minimise economic displacement and thus impacts to herders; grazing land and wells outside the fence, but within the Mine Licence Area have remained open to public access.

The fenceline will be expanded by late 2011 to cover the whole Mine Licence Area (approx. 8,625 hectares). Consultation in early 2011 for the fence extension process identified that a previously resettled herder household was continuing to use a water well on the border of the Mine Licence Area. This is a hand dug well that had been replaced by a deep well closer to the resettled household's new winter shelter. After the fenceline extension this well would have been inaccessible to the herder family.

Even though the well had been replaced by Oyu Tolgoi, after consultation with the herder family, the company negotiated an alteration to the fence extension to allow this well to remain in place for use by the family.

#### *Oyu Tolgoi to Gashuun Sukhait Infrastructure Corridor*

Initial Project planning investigated several transport and power supply options, and preferred routes were identified within the Oyu Tolgoi to Gashuun Sukhait infrastructure corridor. The infrastructure corridor contained two road transport options and a power line transmission option for the connection of Oyu Tolgoi to the Inner Mongolian power grid.

The option of using the Hangi border crossing, further east of Gashuun Sukhait, was dismissed due to the distance of road requiring construction within Mongolia, and because the Wuyuan rail head in China is easier to access (with good roads) and closer from Gashuun Sukhait. The preferred option to Gashuun Sukhait requires the upgrading and eventual reconstruction of approximately 100 km of road as opposed to over 300 km of new road construction required to use the Hangi border crossing. The construction of a road from Oyu Tolgoi to Hangi would also have resulted in three times the land disturbance and resulting disruption to grazing activities than the Gashuun Sukhait crossing option.<sup>9</sup>

The route adopted for the road to Gashuun Sukhait has also been developed to minimise any further resettlement. Mongolian law requires that the easement be such that there should be a distance of at

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<sup>9</sup> Oyu Tolgoi Project Environmental Impact Assessment, Volume I Report of Oyu Tolgoi to Gashuun Sukhait Road and Infrastructure Corridor, Environmental Protection Plan and Environmental Monitoring Plan, Eco-Trade LLC, 2004.

least 50m from winter shelters for any national road. A minimum distance of 250m has in fact been maintained by the Project to avoid any unnecessary resettlement of herder winter shelters, and minimise disruption to herding practices of those closest to the road route. In addition, the southern 23 km of the road will use the Right of Way of the former road used by coal trucks from Tsogttsetsii *soum*<sup>10</sup>, in order to minimise land disturbance (the road will not disturb new land for this portion of the route).

#### *Airport Sites*

As part of the development of the Project, it was necessary to relocate the original airstrip at Oyu Tolgoi as this was located over the area of the proposed open pit. A number of different options were considered for the Airport Sites.

The selected location (for both the Temporary and Permanent Airports<sup>11</sup>) is approximately 7 km north of the Mine Licence Area, and is located on a gravel plain used for summer pasture grazing, but containing no herder winter shelters. This site was chosen because of the need for a relatively flat area in close proximity to the Oyu Tolgoi site, and the requirements of international and national aviation safety. It was the only feasible site that did not require significant ground disturbance for construction, or have any herder winter shelters in close proximity to the site (the nearest herder shelter is over 3km from the sites).

#### *Gunii Hooloi Borefield and Pipeline*

The Oyu Tolgoi Project will be supplied with water via a 70km pipeline from the Gunii Hooloi Borefield. A number of options for the pipeline alignment were examined. As pipelines will be buried and the surface cover will be revegetated, disturbance to summer pasture areas will be limited to the short period of pipeline installation.

The Gunii Hooloi Borefield is located in an area with little or no near-surface aquifers suitable for herder wells. As a result, there are limited herder winter camps in the immediate borefield area (14 winter camps within 5km radius). The pipeline route has been aligned to avoid any resettlement of herder winter camps.

#### *Other Areas*

Land disturbance procedures must be followed by Oyu Tolgoi and contractors before any land disturbance can occur in Project areas. This procedure includes steps for notifying *soum* authorities, obtaining appropriate permits, and consulting with herder communities prior to any activities on the ground. These procedures also require any land disturbance to be minimised wherever possible.

Oyu Tolgoi will also implement a *Transport Management Plan* which include measures such as traffic monitors and signage to eliminate off-road driving, and therefore minimise disturbance to pastureland and herding activities. Drivers will also be given training.

The following sections describe actual (realised) and potential land use impacts associated with the construction and operation of the Oyu Tolgoi Project.

### **10.3.6 Physical Displacement of Herders (Impact Zone A)**

#### ***Description of the Impact***

The Exclusion Zone was agreed between IMMI, local herder households and the *soum* authorities, and resulted in the relocation in 2005 of **10 herder households (16 families or 61 people and approximately 1,850 head of livestock)** whose winter camps were located in the 10 km Exclusion Zone. These herder households were physically and economically displaced through the loss of their winter camp sites, pastureland, the loss of water well/s and disruption to their herding practices.

Only 5 of the 10 herder households had actually built winter shelters at their winter camps. The other households did not have fixed shelters or corrals but had established winter sheltering places where they set up their *gers* on a semi-permanent basis. Nonetheless, Oyu Tolgoi agreed to provide all 10 of the

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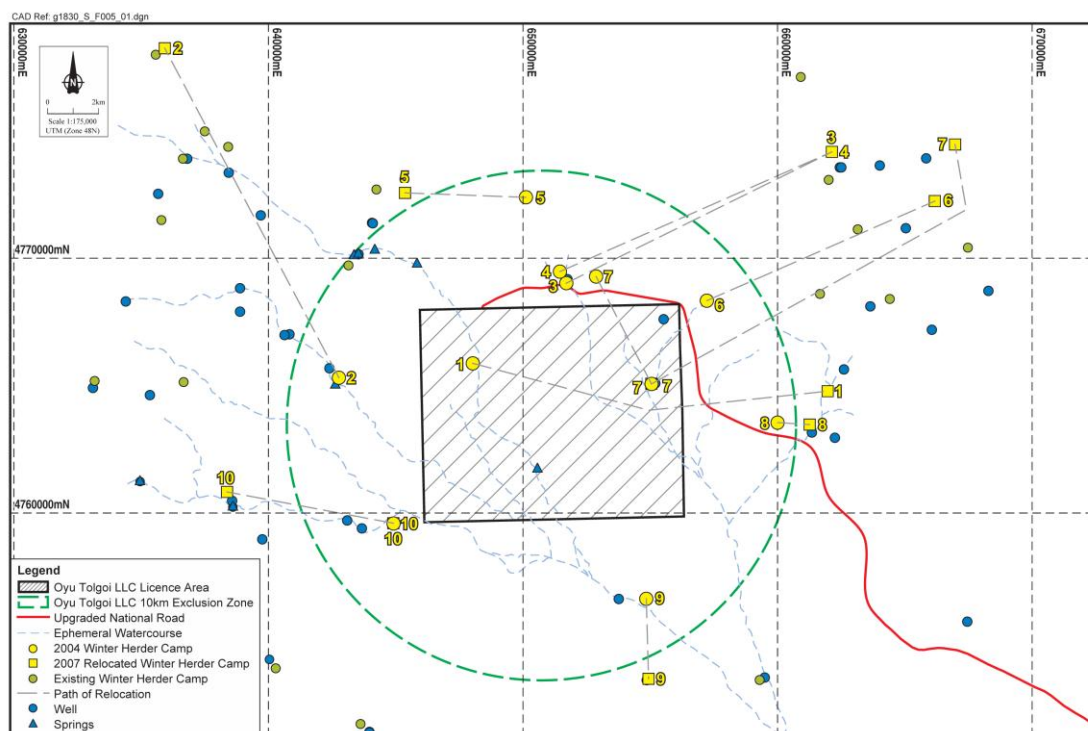
<sup>10</sup> When the coal transportation route was upgraded in 2010/11 a revised route was approved by the Government of Mongolia.

<sup>11</sup> The Temporary and Permanent Airports are located adjacent to one another.

households with new winter shelters and other assistance measures. None of the households had spring shelters that needed to be replaced. Suitable replacement land within close proximity to their previous winter sites was identified to compensate for the physical displacement aspects.

Figure 10.4 below shows the location of the original herder camps and their new location after resettlement. Full details of the *Herder Relocation Programme* are provided in *Chapter D15: Resettlement Action Plan*.

**Figure 10.4: Relocation of Winter Camps In the Mine Site Area**



## Mitigation Measures

### *Herder Relocation Programme and Entitlements Package*

The *Herder Relocation Programme* was designed by Oyu Tolgoi in consultation with all affected families and Khanbogd *soum* authorities. Extensive negotiations were held during 2004 with each herder household to determine and agree their individual resettlement and compensation packages (see *Chapter A6: Community Consultation*). By the end of September 2004, tripartite agreements were signed between each of the affected households, the Khanbogd *soum* government, and IMMI. By the end of 2005 all families had been successfully relocated according to the programme and provided with a comprehensive *Herder Relocation Package*, including replacement assets, compensation and livelihood restoration assistance.

### *Replacement of Winter Shelters*

A replacement residential site for a new winter shelter was identified by each affected herder family, *soum* authorities and their neighbours. A standard compensation package was agreed upon for each resettled household, whether or not they each had the same standards of facilities to start with. Each household received the following:

- A livestock winter shelter constructed according to a standard architectural drawing and budget using logs and sawn materials. This design and these materials were selected because wooden shelters were preferred by herders at the time, as wood is fairly rare in the Gobi, so wooden structures seemed special. All shelters were equivalent or larger in size than those being replaced (most were larger);
- A stockyard fence;
- A small animal barn; and

- A well, either deep or shallow, depending upon water availability at the new site (all were eventually provided with deep wells).

All households obtained like for like replacement of grazing lands and permanent winter camp sites through the construction of permanent shelters and deep wells. The construction of wells in new places opens up previously ungrazed areas and makes them accessible for grazing of livestock. All families were provided with ownership certificates for their new winter shelters by the *soum* government. The construction of shelters, barns and stockyards was undertaken by eighteen members of the resettling families, employed and paid by IMMI for the task.

Old winter shelters that were outside the Mine Licence Area were left in place in accordance with custom and as negotiated with households; and herders can utilise them during seasonal migrations. No households have moved back to their winter shelters.

#### *Compensation for Loss of Customary Grazing Rights*

As grazing land is communal property in Mongolia, it is not possible to provide cash compensation to individual households for loss of pastures, but *in-kind* compensation for loss of customary grazing rights can be given. Oyu Tolgoi provided a number of in-kind compensation measures to each affected household as a part of the *Herder Relocation Package* including:

- 15 goats, 15 sheep and two camels;
- A total of 20 tonnes of “horgoljin” animal feed; and
- Two tertiary scholarships, including travel, accommodation, supplies and fees.

Resettled households were provided with stock feed to ensure that their herds were able to survive the first year. Tertiary scholarships were provided because they were the preferred compensation option for all herder families, as they identified education as a long-term investment in improved household living standards.

#### *Livelihood Support and Other Measures*

One permanent job per household was offered by Oyu Tolgoi as an immediate income improvement option. Jobs (and livestock) were identified by affected households as the preferred option to increase income generation.

A total of 12 people in all were initially employed (two households were identified to have several families in them and thus additional jobs were offered). As of 2011, a total of 14 people from resettled families were employed by the Project (others have subsequently sought and obtained jobs with Oyu Tolgoi or contractors). These workers are employed as forklift drivers, rubbish collectors, assistants to the Community Relations Officers, kitchen hands, carpenters and cleaners etc. These jobs in most cases also involve on-the-job training and experience which is expected to expand employment potential.

In addition to the tangible aspects of the *Herder Relocation Package*, a series of training programmes was arranged for the resettled households, each of which was able to send at least one person of their choice to the following training sessions:

- *July, December 2004, January 2005*: Organised three English language training programmes for herders and their children. The classes were held twice a week continuing for one month each;
- *February 19-21, 2005*: Conducted a three-day business workshop titled “*Business opportunities, how to begin a business?*” Total of 15 persons from 10 households participated in the workshop;
- *May 2005*: Conducted a three-day workshop on “*Methods of sorting cashmere and quality breeding*” for resettled herder households; and
- *June 2005*: Organised a three-day workshop on “*Pasture management*” in for all resettled herder families.

The language training was provided by Peace Corp Volunteers and each of the workshops was provided in collaboration with the *Gobi Regional Economic Development Initiative* (a regional NGO).

#### *Monitoring of Resettled Families*

A first formal review of resettled families was conducted at the end of 2006 after resettlement. Between 2007 and 2009, development of the Oyu Tolgoi Project slowed down due to a delay in signing the

Investment Agreement (IA) with the Mongolian Government. In the following three years, the small Oyu Tolgoi Community Relations team maintained regular contact with the resettled families, especially in implementing the scholarship support for two students from each household to study at the desired university in the capital city and in providing school supplies and uniforms for two high school students from each family. In addition to meetings held to deliver necessary school supplies and fees, meetings were also held with each household to monitor progress of scholars and the families in general. Although no formal monitoring programme was undertaken, relationships were maintained with the resettled families and additional support provided as needed and requested.

More frequent engagement with resettled families commenced again by the end of 2009, as the Project moved into the construction phase. In 2010, another formal review of resettled families was conducted by Oyu Tolgoi. The two formal reviews of resettled families are summarised as follows:

- *Initial Review in December 2006:* a review of the relocation programme was conducted with resettled households, local authorities and IMMI. This was conducted to assess and plan the next steps of the *Herder Relocation Programme*. The meeting concluded not only with participants expressing satisfaction with IMMI's conduct in fulfilling its contractual obligations, but also with a high level of appreciation from the herders and local government representatives. In addition, it was decided that new wells would be established for three households that experienced difficulties with access to water. This commitment was fulfilled in March 2007.
- *Satisfaction Survey and Evaluation in October 2010:* Oyu Tolgoi conducted a formal survey of the resettled families to determine whether the resettlement process had been successful in ensuring that families had been able to at least restore their livelihoods and improve their standard of living. Overwhelmingly, the responses of the resettled families demonstrated that they have improved their standards of living since resettlement. Key findings can be summarised as follows:
  - All families reported their standard of living, income, herd quality, and access to pasture, to be at least as good as, or better than, before they were resettled;
  - The average percentage of wage income for families in 2004 was 64%, and by 2010 this had risen to over 80%. There were no families entirely dependent on wages in 2004, and by 2010 one family was entirely dependent on wage income;
  - A total of 13 families had increased their herd size since 2004, with some families doubling and tripling their herd size. With respect to the 2 families who reported less livestock, in both cases this is due to the family moving to the *soum* centre and taking on other economic activities;
  - A total of 7 out of 15<sup>12</sup> families surveyed now reside in the *soum* centre. All households retain their rural places and herds, but employ relatives or others to mind their herds. This is a clear indication of improved economic status, being able to choose between staying in the town or countryside;
  - There was a steady accumulation of consumer durables. The number of mobile phones rose from 2 in 2004 to 16 in 2010. The other major items acquired are televisions and satellite dishes, which were owned by 13 of 15 families by 2010, whereas only 5 families had satellite dishes and 8 televisions in 2004. A total of 2 extra cars and one additional motorcycle were acquired over the period;
  - Three families reported less access to water. The issue of access to water problems relates to well repair/servicing issues, and Oyu Tolgoi is providing well maintenance; and
  - Six families reported that their standard of living was better than before resettlement, and the other nine said that their standard of living was the same. None reported that their standard of living had deteriorated since resettlement.

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<sup>12</sup> Due to death one family no longer exists and the household has become a single family unit which is why only 15 not 16 families were surveyed in the 2010 study.

Even though many indicators including income and assets point towards improved living standards for most households, Oyu Tolgoi has followed up to understand why the other 9 families feel that their standards of living have still not improved. All resettled herder households are included in the *Sustainable Pastureland Management Programme* being implemented by Oyu Tolgoi, with a view to helping them improve their pastureland management and herding practices. The *Sustainable Pastureland Management Programme* is being developed in conjunction with comprehensive pasture health monitoring and water monitoring programmes, all aimed at improving pastureland resources in Khanbogd *soum*.

After further consultation, four of the resettled families were identified as vulnerable and as needing more assistance due to employment problems, infirmity due to age or other disability. Specific measures have been undertaken with each of these families to find alternative means of increasing income and support for improved job retention. Further results showing the progress of resettled herders families between 2004 and 2010, as well as the various pasture and water related management programmes being implemented by Oyu Tolgoi are provided in *Chapter D15: Resettlement Action Plan*.

### **Impact Significance**

Physical displacement of affected households from the Mine Site Area has already occurred so the impacts are **certain**. Impacts to herder families will be permanent will be **(long term)** but **localized**. For herders resettled as a result of the Project, comprehensive compensation and mitigation measures have already been implemented, so the residual impacts can be classified as **moderate adverse**. In the long-term, impacts are expected to decrease further as affected people realise some of the benefits of compensation and livelihood restoration initiatives, and the *Sustainable Pastureland Management Programme* and other pasture health monitoring and related activities are implemented. .

## **10.3.7 Economic Displacement: Loss of Summer Pastures (Impact Zone B)**

### **Description of the Impact**

Land acquisition for the airport sites will result in the loss of summer pastures for a number of herder households, including 46 ha of grazing land for the temporary domestic airport site and 230 ha for the planned permanent airport (which is directly north of the temporary airstrip).

**A total of 22 herder households** who have winter shelters within 11 km of the airport sites have been identified as having customary grazing rights in the area, and thus will be impacted by reduced access to/loss of summer pastures. Consultation has identified that these households are differentially affected by the loss of these summer pastures, and can be categorised as follows:

- **7 herder households** have winter shelters within 5km of the airport sites (Impact Category B1) and have traditional summer grazing rights in the area. These households have been identified by community consensus as users of the actual airport sites during summer and autumn for seasonal grazing. The airport facilities are in the preferred summer pasture area for these households, and they will be required to migrate elsewhere or utilise less pasture during their seasonal migrations as a result of the Project; and
- **15 herder households** with winter shelters within 5-11 km of the airport sites (Impact Category B2) have been identified through community consensus that concluded that these households did not customarily graze at the actual airport sites, but in the wider vicinity. These households are, thus, not economically displaced, but could experience some impacts to their seasonal grazing patterns due to reduced summer pastures coupled with less overall choice of summer pastures in the future. Oyu Tolgoi has agreed that these households are eligible to some individual assistance in addition to that being provided to all herders in Khanbogd *soum*).

There are no winter shelters in the footprint of the airport sites and the closest winter shelter is over 3 km from the area. However, a permanent reduction in available summer pastures may force some affected herders to reduce their livestock numbers, and this could impact on livelihoods. These households may also be affected by noise during seasonal grazing activities, although no specific noise issues have been raised by communities as a result of airport operations to date.

### **Mitigation Measures**

Affected herder households have identified a range of measures to compensate for the loss of summer pastures. Each of the key measures are summarised below, with full details provided in *Chapter D15*:

*Resettlement Action Plan (RAP)*. Herder families are entitled to a combination of these packages depending on their eligibility which is set out in the *Entitlements Matrix* also included in the RAP.

#### *Employment*

All herder households affected by loss/reduction of summer pastures at the airport sites have expressed the desire to have one or more family members employed with the Project. One permanent job for one member of each eligible household will be offered. Required training to support employment will be also provided (e.g. job readiness, technical training).

During consultation, these affected herders expressed an interest in waged labour, not necessarily with Oyu Tolgoi or in mining. As a result, Oyu Tolgoi has identified a number of opportunities for herders to be employed by the Company outside of the mine site, in casual roles such as site cleaning/maintenance around the airport perimeter and along the road from site to the border with China.

As at May 2011, 3 people from households displaced by the airport sites had been employed by Oyu Tolgoi to supervise and maintain the cleanliness and condition of the airport perimeter area. There are no set hours for this job, so it fits in well with the continuation of other herder duties. Instead, performance standards are maintained by weekly visits from a Community Relations Officer member from the Khanbogd office. The salary is equivalent to that of other unskilled employees who work at the mine, so the herders are satisfied as they can earn an income while remaining close to their land and livestock. Other positions are being identified and arranged for the remaining households.

#### *Education Assistance*

Education assistance for herder children has been identified by all herder families as a preferred means of compensation. It not only provides herder children with greater access to a range of education opportunities, but also provides a significant contribution to household living expenses.<sup>13</sup> Education support and scholarships are being offered to the 7 households most affected by airport construction, as an assistance measure for temporary construction impacts to summer pastures as well as for the loss of customary grazing rights.

Education assistance for eligible herder households includes:

- *Tertiary scholarships* for one student per eligible family. Scholarships are calculated on a case by case basis, but all include school fees, travel and board for each student for the duration of the college place, up to an agreed maximum. As of end 2010, a total of 14 tertiary scholarships had been disbursed by Oyu Tolgoi to economically displaced herder families. Other disbursements are ongoing; and
- *Equipment and materials support for school students* of eligible affected families will be provided. This assistance will be provided in the form of materials, equipment, uniforms etc, to an agreed amount. All primary/secondary school students in each eligible family will be provided with this support by Oyu Tolgoi for 5 years.

Households that may not have students now or in the future, can negotiate alternative compensation to an equivalent amount. Further information is provided in *Chapter D15: Resettlement Action Plan*.

#### *Local Business and Economic Development*

Oyu Tolgoi has developed the *Local Business and Economic Development (LBED) Programme* to support development of a robust and diverse small and medium-sized enterprise (SME) system in Khanbogd *soum*. Eligible and interested herder households will be given priority inclusion into this programme, and also a contribution towards any capital investment required up to an agreed amount. Affected herder households that participate in this programme will be provided with all training and support provided to other participants in the programme (financial, technical and business training), plus

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<sup>13</sup> Remote herder families often spend a large proportion of their household income on student education and boarding fees.

additional mentoring and monitoring wherever required. Initially 10 affected herder households are being targeted for business development opportunities through this programme in 2011.<sup>14</sup>

#### *Vocational and Other Training*

Oyu Tolgoi will offer training opportunities to eligible and interested herders to improve their vocational and/or business development skills and long-term income generation prospects. This includes:

- *Short term training:* Affected herder households have identified non-mining training as an in-kind compensation measure that will help them to establish new and/or improved livelihoods. Short-term vocational training will be offered to eligible households for an agreed amount and period of time (one training event of up to 45 days in Mongolia); and
- *Local worker training:* For affected people interested in employment with Oyu Tolgoi, they will be prioritised for bridging/job-readiness training packages to support them to obtain and maintain employment with Oyu Tolgoi or contractors. Oyu Tolgoi is working with Rio Tinto to develop a range of bridging/job-readiness training packages and this will start implementation in 2011.

Training opportunities for local residents will be especially effective when the *Khanbogd Technical and Vocational Education Centre* is built by Oyu Tolgoi in 2011. Prior to that time, training will be offered at Oyu Tolgoi site and elsewhere in Mongolia.

#### **Impact Significance**

The impacts from a loss of summer pastures due to the airport sites will be permanent (**long-term**) but **localised**. The temporary airport is already in use so the impacts are **certain**. Because the most affected herders near the airport sites have already had household members employed by Oyu Tolgoi and are being provided with other assistance measures, the residual impacts can be assessed as **moderate adverse**. In the long-term, impacts are expected to decrease as affected people realise further benefits of the livelihood restoration initiatives.

### **10.3.8 Division of Permanent Pastures (Impact Zones C, D)**

#### ***Description of the Impact***

The construction of several Project components requires *linear* land take or disturbance, including the Oyu Tolgoi to Gashuun Sukhait Road upgrade, the Gunii Hooloi Borefield and Water Pipeline and the Transmission Line from site to the border with China. There are no winter shelters directly in the footprint of any of these facilities. There will be four temporary worker camps required during upgrade works on the Oyu Tolgoi to Gashuun Sukhait road, and for the water pipeline and transmission line construction. These will be in place for an estimated 12 months (some camps will move as required along the infrastructure route). Each of these features has been surveyed by Oyu Tolgoi and their interactions with herders evaluated.

#### *Oyu Tolgoi to Gashuun Sukhait Road Upgrade*

The construction of the Oyu Tolgoi to Gashuun Sukhait Road, will involve approximately 80 km of new road to the Chinese border. The road will be 8-10 m wide with an easement of 1.5 m on either side. The new road will limit disturbance/land loss to the 14 m wide corridor of road surface. As described above (see Section 10.3.5), the southern portion of the Oyu Tolgoi to Gashuun Sukhait Road (approximately 23 km) will use the former coal transportation route.

A total of 4 herder households have winter shelters within 500 m either side of the Oyu Tolgoi to Gashuun Sukhait Road (Impact Category C1), and will be affected by division of pastures during construction and operations. Road construction in any one stretch of the road (approximately 6 km per section) is expected to last approx. 12 months. These households will be affected by severe disruption during the construction phase, including dust due to topsoil stripping, hazards from equipment and people, and noise due to construction activities.

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<sup>14</sup> This is intended to include all those eligible affected households requiring livelihood restoration support, and is based on interest expressed by affected herders to date. This will be expanded as required if more affected herders are interested in this program.

These households will have at least a portion of their winter pastures permanently intersected by the road, since the road will become part of the National Road system. If herders become less mobile, they may be pressured to overgraze some areas, further degrading pastures and creating potential conflict between neighbours.

#### *Gunii Hooloi Borefield and Pipeline and Transmission Line*

The Gunii Hooloi Borefield and Pipeline and Transmission Line will result in the temporary disturbance of land during construction due to topsoil stripping and other related activities. The Gunii Hooloi Water Pipeline Phase 1 will require land disturbance for a single pipeline, whereas the Water Pipeline Phase 2 construction will require greater land disturbance due to the various pipelines required for each borehole coming from the main pipeline and also for pump stations and water storage lagoons (see also Section 10.3.3 above). The permanent features of these facilities will be in the form of the boreholes/pumps/lagoons and transmission tower foundation pads, as well as a single track maintenance route of approximately 3.5 m width with occasional passing places that will remain along the pipeline route.

A total of 11 herder households have winter shelters within 1km either side of the Water Pipeline Phase 1 or the Transmission Line, or within 3 km of the Water Pipeline Phase 2 (Impact Category D1). Construction activities have resulted in a trench along the pipeline route, and the presence of equipment and earthworks along the transmission line route. As a result the permanent pastures of these households have been divided. Although herders can still access their pastures, Oyu Tolgoi has identified that during consultation they have to travel further and spend a greater amount of time tending to their herd, due to risks associated with construction features and equipment (e.g. trenches and heavy equipment). These households are also impacted by dust and noise impacts.

Even though the construction phase will be temporary, it could take a number of years for pastures to be fully rehabilitated to be equal to, or better than pre-Project levels of vegetation/forage quality. These households are not likely to experience significant long-term impacts due to operation of these facilities (e.g. about 1-2 vehicles/day for maintenance), as long as rehabilitation of land is proactively and rapidly implemented.

#### **Mitigation Measures**

As described previously, affected herder households have developed a range of in-kind compensation and livelihood support measures with Oyu Tolgoi to compensate for the division of pastures and severe disruption to their herding practices. These households are most affected by economic displacement as a result of the Project and will be provided with significant support to ensure they can maintain their livelihoods and improve their standards of living. Other construction and engineering controls that will be implemented to minimise impacts are described below.

#### *Employment*

All herders affected by the division of pastures have expressed the desire to have one or more family members employed with the Project. As of May 2011, a total of 12 herders from 12 households had been employed as road-side cleaners. These employees are responsible for maintaining a clean environment along 6 km stretches of road. Other positions are being identified and arranged for the remaining households affected by the water pipeline and transmission line.

#### *Assistance to Establish New and/or Improved Livelihoods*

Individual business guidance and livelihood support packages are being provided for all herders whose permanent pastures are divided by linear features of the Project. Packages for these households are being individually tailored to meet the livelihood improvement needs of each specific household and include a wide variety of investment options. Oyu Tolgoi will provide substantial investment in capital purchases, improved livestock quality, business development, mentoring and ongoing support, equipment upgrade etc.

Development and implementation of these packages will utilise partnerships already established through the *Local Business and Economic Development Programme*, including those with NGOs experienced in herder business development, local banks and technical training partners etc. These packages are in development with eligible households and will be implemented in 2011.

### *Education Assistance*

Education assistance for children has been identified by herder families within Khanbogd as a preferred measure. All herder families affected by division of pastures will receive tertiary scholarships as a material compensation measure. The 4 households most affected by the Oyu Tolgoi to Gashuun Sukhait Road will also receive equipment and materials support for school students as additional assistance because the impacts from the road are more significant.

### *Construction and Engineering Controls*

A number of construction practices and procedures will help to minimise land disturbance. These include:

- Oyu Tolgoi will implement land disturbance procedures and permits, including prior notification of potentially affected households, prior to construction or other Project activities;
- Rehabilitation of all temporarily disturbed land will be actively implemented as soon as is practical, and Oyu Tolgoi will work with local herders to implement rehabilitation works and involve them in monitoring the progress of reinstatement of pastures; compensation procedures will be applied where satisfactory reinstatement of pastures is delayed or unsatisfactory; and
- Disturbance of sites outside Project areas will be strictly prohibited.

### *Transport Management*

Oyu Tolgoi will construct and seal approximately 100 km of road from the site to Gashuun Sukhait at the Chinese border. This will provide a designated route for the road, and minimise land disturbance due to off-road driving.

### *Impact Significance*

The impacts from division of pastures for households closest to construction activities and Project facilities are **certain**, as construction is already underway. The impacts will be permanent (**long-term**) but **localised**. Because the herders most affected by division of pastures have already been employed by Oyu Tolgoi and are being provided with other assistance measures, the residual impacts can be assessed as **moderate adverse**. In the long-term, impacts are expected to decrease as all affected people realise further benefits of the livelihood restoration initiatives.

## **10.3.9 Disruption to Herding Practices (Impact Zones C, D, F)**

### *Description of the Impact*

During consultation, Oyu Tolgoi identified that herder households residing further away from Project facilities could also be impacted by potential disruption to their herding practices. Households not near to Project facilities are still likely to be affected by some construction activities, e.g. pre-stripping of topsoil and road use are likely to mobilize large quantities of dust particles which may have negative impacts on pastures, livestock and households.

Noise during construction may also impact herders and livestock at some distance from Project activities. Herders have reported to Oyu Tolgoi that baby animals are particularly vulnerable to excessive noise. Restrictions in access in the general area due to Project activities may also cause herders to have to migrate over longer distances or change migration patterns, particularly during construction when activities will be intense and widespread.

### *Oyu Tolgoi to Gashuun Sukhait Road Upgrade*

A total of 14 herder households have winter shelters within 500m – 6.5km either side of the Oyu Tolgoi to Gashuun Sukhait road (Impact Category C2), and are likely to be affected by some minor to moderate disruption to herding practices during construction activities. Based on consultation, these herders will be more readily able to change herding practices to avoid impacts from the road than those within 500 m, however, this could result in overgrazing of some areas and potential conflicts with neighbours.

Some herders with winter shelters in this impact zone may also be impacted by long-term impacts from operation of the road, as increasing traffic could present a hazard to their livestock and an ongoing disruption to their grazing patterns. It has been identified through recent consultations in 2011, that households between 500 m and 3.5 km either side of the road are potentially more affected by permanent impacts from the operation of the road than those between 3.5 to 6.5km. It has therefore been agreed

that these households will receive a higher level of contribution towards their individual livelihood support packages (see *Chapter D15: Resettlement Action Plan*).<sup>15</sup>

#### *GH Borefield Water Pipeline and Transmission Line*

A total of 11 herder households have winter shelters within 1 km – 2 km either side of the Water Pipeline Phase 1 or Transmission Line, or within 3-7km from the Water Pipeline Phase 2 (Impact Category D2) (See *Figure 10.2*). These households will be affected by minor to moderate disruption to herding practices during construction. They are not in the immediate vicinity of construction activities and will therefore be less affected by noise and dust. Potential impacts to these households will be restricted to the construction phase and will be localised in nature.

#### *Unoccupied Winter Shelters*

A total of 22 unoccupied winter shelters are present within the “impact zones” identified for the Project (Impact Category F). The owners and their families now reside in the *soum* centre, usually as a result of waged employment or small businesses.

Within this category Oyu Tolgoi has identified 4 households (Impact Category F1) who report having abandoned their winter shelters a year or so earlier due to adverse impacts from the coal transportation route traffic and the unplanned and largely unmanaged expansion of *Tsagaan Khad*, the truck stop near the China border post. Although the impacts to these households cannot be directly attributed to Oyu Tolgoi Project activities, the Company has acknowledged that their abandoned winter shelters are within the designated impact zones for the Project and that cumulative impacts may have caused these herders to abandon their shelters. These four households have been identified as vulnerable people by Oyu Tolgoi (see *Chapter D15: Resettlement Action Plan*).

The other 18 households are unlikely to experience any direct disruption (Impact Category F2), however, Oyu Tolgoi recognises that they have property rights, and that they may be affected by construction activities when they visit their shelters (most of these non-resident owners retain their herd, and pay other people, often relatives (either in-kind or cash) to look after their livestock (i.e. agistment) in another place). There are not expected to be any permanent impacts to these winter shelters.

#### **Mitigation Measures**

Herder households affected by minor to moderate disruption to herding practices during construction activities have identified education assistance for children and short-term training as the preferred assistance measures for temporary inconvenience and nuisance impacts. Each of these has been summarised above. These affected households are entitled to a combination of these packages depending on their eligibility which is set out in the *Entitlements Matrix* (in *Chapter D15: Resettlement Action Plan*).

Oyu Tolgoi also intends to provide special assistance to the vulnerable households identified as having abandoned their winter shelters near *Tsagaan Khad*. These households will be provided with livelihood improvement measures tailored to their needs. During consultation these households all expressed a desire to be employed by Oyu Tolgoi and one job per household will be offered to these families similar to those impacted in other Project areas (see *Chapter D15: Resettlement Action Plan* for further details).

#### **Impact Significance**

The impacts from disruption to herding activities for households within the outer impact zones (e.g. greater than 500m from Project facilities) will be: **medium term**; **localised**; and **likely**. The impacts from construction will be temporary and these households are not expected to be disrupted by Project activities in the longer-term. Because herders have indicated that they can avoid most construction activities and impacts by changing their herding practices, the impacts have been assessed as **minor adverse**.

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<sup>15</sup> Note: Impact zone C2 remains unchanged (500m-6.5 km), and is therefore not shown as two sub-categories within the tables or maps, in order to avoid confusion. The recognition that those within -3.5 km may require some additional livelihood support is dealt with through the Entitlements Matrix in *Chapter D15: Resettlement Action Plan*.

### 10.3.10 Water Access Restrictions or Loss

#### *Description of the Impact*

Construction and operation of some Project facilities will result in a number of herder households being “cut off” from their wells. Other Project activities may also impact water supply or the quality in herder wells, such as damage to wells from construction activities, contamination due to unplanned spills or leaks or reduced water levels as a result of Project water extraction.

There are a total of 4 herder households that will be affected by restricted access to their water wells as a result of the Project. The households affected by well/water impacts are:

- 1 herder household within 500 m of the Oyu Tolgoi to Gashuun Sukhait road whose main camel pasture area is on the other side of the road from the winter shelter and well;
- 2 herder households within 1 km of the GH borefield pipeline. These households have a well on the other side of the pipeline route from their winter shelters and have restricted access to their well due to trenches and pipeline equipment; and
- 1 herder household that was resettled in 2005 and has a winter shelter outside of the Exclusion Zone, has a well on the boundary of the Mine Licence Area. This household established another well in addition to that provided by Oyu Tolgoi in 2005, on the boundary of the Mine Licence Area. The fence extension that is being erected around the entire Mine Licence Area has been modified to ensure this well can remain in place, however, this household has reported some issues with this well and Oyu Tolgoi is working with this household to resolve the issue.

These households are all covered in another category of impact, e.g. division of pasture, disruption of herding practices etc. They are therefore eligible for compensation for their wells in addition to measures being provided by Oyu Tolgoi for other displacement impacts (as described in the entitlements).

#### *Mitigation Measures*

Oyu Tolgoi guarantees water supply for any affected households. Each affected herder household will be provided with a replacement water supply, by:

- Guaranteed water supply for any affected households by providing new or reconstructed wells in a timely manner, as agreed in consultation with affected herders and in alignment with pastureland management plans;
- Comprehensive monitoring programme throughout Khanbogd soum, including the monitoring of 94 herder wells and regular contact with all herders with wells close to Project facilities; and
- Replacement well locations will be in alignment with pastureland management plans that are developed by the Pasture User Group in the area (see Section 10.3.10 below).

Each of the 4 herder households identified as being impacted are located in an area where a suitable replacement well could be installed in an alternative aquifer which is known to be present in the area. Oyu Tolgoi has good experience at identifying suitable locations for alternative herder well supplies as illustrated by the successful relocation of herders from the Mine Licence Area. The Oyu Tolgoi Environment Department has a comprehensive water monitoring programme throughout Khanbogd soum, including monitoring of 94 herder wells and is in regular contact with all herders with wells close to Project facilities. Oyu Tolgoi's herder well monitoring programme in conjunction with the Participatory Environmental Monitoring (PEM) programme will enable any herder well which is affected by the Project (or other external factors such as natural silting of the well) to be identified early before the impact is significant so that a suitable remedial strategy can be developed in consultation with the herder. This may include cleaning the existing wells or assisting with the installation of a new well nearby. Further information on herder well management is provided in *Chapter C5: Water Impact Assessment*

#### *Impact Significance*

Impacts to herder wells will be **highly localised**, but are also **certain**, as construction of Project facilities is already underway. Restricted access to/loss of wells will be **short-term**, as long as replacement wells/water supply are provided in a timely manner. Because water supply/quality will be ensured for any affected herders the impact is assessed as **minor adverse**, or better, as it is likely that improved wells/supply will be provided by Oyu Tolgoi in these cases.

### 10.3.11 Communal Grazing Land Loss (Impact Zone E)

#### **Description of the Impact**

A total of about 11,000 ha of land is required for temporary and permanent facilities by the Oyu Tolgoi Project (see *Table 10.1*). Local herders will no longer have access to land in the Project footprint. Some land is also temporarily required during construction, e.g. for lay down areas, mobile worker camps, topsoil stripping for the water pipeline and borrow pits.

Oyu Tolgoi recognises that all seasonal herders in the *soum* could potentially be affected by a reduction of grazing land – this is a communal or shared loss. As of October 2011, there are a total of **399 herder households in Khanbogd soum** that have been identified through extensive consultation as potentially impacted by an overall reduction in grazing land. Whilst there is an abundance of grazing land in the region, it varies in quality and accessibility during different seasons and over different years. Herders affected by loss of pastures may be able to find new grazing areas, however, the vital condition or pastoralism is open grazing over vast pasture areas.<sup>16</sup> Any reduction in the size of pastureland and forage resources associated with mine development will lead to the re-distribution of existing grazing resources among current users, thus increasing pressure on grazing land (and water resources) and exacerbating the potential for conflict.

Since the majority of land required for the Project is in Javkhlant and Gaviluud *baghs*, these communities will be most affected by an overall loss of pastureland. However, it is important to note that herders have indicated to Oyu Tolgoi during consultation, that they do not necessarily observe local administrative boundaries when migrating to summer pastures and thus any reduction in grazing land in one *bagh* could lead to impacts on herders in neighbouring *baghs*.

#### *Total Pasture Resources*

Khanbogd *soum* has an estimated total pasture area of 1,497,591 ha<sup>17</sup>, according to the *Mongolian Society for Range Management* (see *B10: Land Use Baseline*). Using a conservative estimate of the total land required or disturbed by the Oyu Tolgoi Project of 20,000 ha, the loss of pastureland in the Khanbogd *soum* due to the Project would be approximately 1.3%. However, this does not take into consideration that a significant proportion of the pastureland in the *soum* is underutilised by herders due to insufficient water supply. In 2010, the *Mongolian Society for Range Management* calculated that the *soum* had a total of 791,239 ha of pasture with water supply for human and animal consumption. Based on this figure, a loss of 20,000 ha of land to mining-related uses (conservative figure) would equate to a 2.6% reduction of the total pasture with water supply in the *soum*.

#### **Mitigation Measures**

Community compensation is intended to offset the permanent loss of pastureland, deemed to be a community resource, regardless of compensation to families or households and livelihood restoration initiatives. Community compensation will be exclusively in-kind, in the form of permanent pasture management and improvement measures such as well rehabilitation, animal dips, veterinary services, and so on. These improvements will be implemented through the Sustainable Pastureland Management Programme that Oyu Tolgoi has contracted the Mongolian Society for Range Management to develop and implement in Khanbogd *soum*.

#### *Sustainable Pastureland Management Programme*

During various consultations herders have requested help from Oyu Tolgoi to improve pastureland management and herding practices. The Sustainable Pastureland Management Programme has been designed to preserve or improve the normal state of pastures, develop the livestock husbandry sector in a

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<sup>16</sup> Through consultation with herders and *soum* authorities in 2010 and 2011, it was determined that previous summer grazers in the Mine Licence Area (in addition to the 10 resettled households) could not be individually identified as having customary grazing rights. It was therefore agreed that compensation for previous summer pasture use in the Mine Licence Area would be addressed by community-level compensation for an overall loss of pastureland in Khanbogd *soum*.

<sup>17</sup> This figure is the one used by the Mongolian Society for Range Management for their assessment of pastures within Khanbogd and is therefore the most recent figure available.

stable manner, reduce pasture deterioration and implement measures to help herders to use and protect the pastures within the Khanbogd *soum*. The design phase of this work began in September 2010. The first phase of this work was completed at the end of 2010, with the following outcomes:

- A study on pastureland health in the *soum*, including analysis of vegetation and pasture conditions at 33 sites across the four *baghs*;
- Establishment of 15 long-term vegetation monitoring sites;
- Establishment of a Rangeland Health Monitoring database for Khanbogd *soum*, developed by Jornada Experimental Range (USA);
- Assessment of the current carrying capacity of Khanbogd *soum*; and
- Establishment of a Community Based Organisation (CBO) of Pasture Users in Khanbogd *soum* and 14 Pasture User Groups (PUGs) comprising neighbouring herder households (a total of 399 herder households are involved in the PUGs).

Each Pasture User Group is preparing a pasture management plan for their traditional grazing land. These plans are intended to identify measures to improve pasture management. Oyu Tolgoi will support specific measures proposed to an agreed amount (see *Chapter D15: Resettlement Action Plan* for details on the budget).

Proposed measures are likely to include:

- Well rehabilitation and creation;
- Pasture rehabilitation and revegetation programmes;
- Improved veterinary services, animal vaccinations, animal dips;
- Training in improved animal health care; and
- Support to enhance subsistence and marketable production of animal products.

All herders in the *soum* are eligible to participate in the *Sustainable Pastureland Management Programme*. In addition to supporting this initiative, Oyu Tolgoi is also contributing to a “Revolving Fund” for each Pasture User Group, which will be a small contribution per household, to be used to earn interest and be available for future use by participating herders.

#### *Land Rehabilitation*

Temporary land disturbance areas will also be rehabilitated after construction ends, so that land can be returned to its pre-Project usage capability, as quickly as possible. Rehabilitation works will include best international practice for grading, topsoil restoration, and revegetation with suitable species.

Oyu Tolgoi has developed a Seed Collection Project within Khanbogd and Manlai *soums*. This work aims to collaborate with local herders to collect seeds and participate in rehabilitation of grazing lands. By 2011, a total of 10 tonnes of seeds had been collected, and are stored in collaboration with local herders and *soum* authorities. A trial biological rehabilitation project in the temporary airport area was implemented in 2010, and 975 kg of seed was also used to rehabilitate an area of 65 hectares in Manlai *soum*. If land cannot be adequately restored, additional compensation measures will be implemented. Oyu Tolgoi will work with the Mongolian Society for Range Management, other specialists as relevant, and herders to define the criteria for rehabilitation of temporarily disturbed areas, and thus the criteria for developing additional compensation, if required.

#### **Impact Significance**

The impacts from an overall loss of pastureland and increased competition for grazing resources will be: **long-term**, and **certain** as at least a portion of grazing land in the *soum* will be permanently converted to roads, airport and mining footprint, even after mine closure. The impacts will be **widespread** as loss and disturbance of grazing land is spread throughout the *soum*. Given that a large proportion of the population (approximately 40%) are dependent on grazing land for their livelihoods, impacts can be assessed as **moderate adverse**, as long as appropriate support measures are implemented for *soum* herders, and progressive rehabilitation is successfully completed.

## 10.4 SUMMARY OF RESIDUAL IMPACTS

Significant residual land use and displacement impacts after the implementation of mitigation measures by Oyu Tolgoi will include:

- Herder resettlement and associated changes to *herding* activities and livelihoods as a result of physical and economic displacement;
- Reduction in the overall quantity of grazing land available for local pastoralists;
- Division of pastures for some herders families, affecting seasonal migration routes and access to grazing land and other resources;
- Increases in mining-related employment and new and diversified land and non-land based income opportunities and associated increases in income and household wealth; and
- Improved pastureland management within the soum, including positive changes to livestock raising and production, and thus rural livelihoods.

The overall impact of physical and economic displacement of herders is significant and will require resettlement, with livelihood restoration and pastureland management programmes to be well designed and implemented. With effective implementation of the *Resettlement Action Plan*, the loss of pastures and other land use changes is likely to be adverse in the short-term for local herdsman. However, it is expected to decrease and potentially result in benefits for affected herders in the long-term, as they realise benefits from increased income generation opportunities, education and training assistance, and other regional community development programmes being implemented by Oyu Tolgoi.

*Table 10.4* summarises the actual and potential land use and displacement impacts of the Oyu Tolgoi Project.

**Table 10.4: Summary of Land Use Impacts**

Impact	(1) Receptor	(2) Phase	(3) Impact Categorisation	(4) Potential Significance	Design and Mitigation Measures	Management Plans, Policies and Procedures	Residual Significance
Physical displacement of herder households	Resettled herder households	Construction Operations Mine Closure	<b>Duration</b> Long-Term <b>Extent</b> Localised <b>Likelihood</b> Certain	Major Adverse	<ul style="list-style-type: none"> <li>■ Implementation of the Herder Relocation Programme in close consultation with affected herders from 2004 to 2005.</li> <li>■ Herder relocation package including compensation and livelihood restoration measures.</li> <li>■ Replacement winter shelter and deep well with certificate on new grazing land agreed with <i>soum</i>.</li> <li>■ Permanent jobs for one member per household, training and other business development support for resettled families.</li> <li>■ Survey and monitoring of resettled herder households in 2006, 2010 and ongoing.</li> <li>■ Close out/completion audit of resettled herders.</li> </ul>	Herder Relocation Agreement (see Resettlement Action Plan) Herder Relocation Report (internal document) Resettlement Action Plan	Moderate Adverse
Economic displacement (loss of summer pastures)	Affected herder households	Construction Operations Mine Closure	<b>Duration</b> Long-Term <b>Extent</b> Localised <b>Likelihood</b> Certain	Major Adverse	<ul style="list-style-type: none"> <li>■ Permanent job opportunities with Oyu Tolgoi.</li> <li>■ Business development opportunities through the Local Business and Economic Development Programme.</li> <li>■ Education assistance through tertiary scholarships and material and equipment support for school students.</li> <li>■ Vocational and other herder training opportunities for employment and new business development.</li> <li>■ Participation in the Sustainable Pastureland Management Programme.</li> </ul>	Resettlement Action Plan Local Business and Economic Development Programme	Moderate Adverse
Division of pastures (caused by linear Project facilities)	Affected herder households	Construction Operations	<b>Duration</b> Long-Term <b>Extent</b> Localised <b>Likelihood</b> Certain	Major Adverse	<ul style="list-style-type: none"> <li>■ Choice of route alignment for pipeline to avoid winter shelter sites.</li> <li>■ Designated animal crossing points established in consultation with herders.</li> <li>■ Road signage and traffic controls.</li> <li>■ Permanent job opportunities with Oyu Tolgoi.</li> <li>■ Business development opportunities through the Local Business and Economic Development Programme.</li> </ul>	Resettlement Action Plan Transport Management Plan Air Quality Management Plan Stakeholder Engagement Plan Community Grievance Procedure and complaints logs.	Moderate Adverse

Impact	(1) Receptor	(2) Phase	(3) Impact Categorisation	(4) Potential Significance	Design and Mitigation Measures	Management Plans, Policies and Procedures	Residual Significance
					<ul style="list-style-type: none"> <li>Education assistance through tertiary scholarships and material and equipment support for school students.</li> <li>Vocational and other herder training opportunities for employment and new business development.</li> <li>Participation in the Sustainable Pastureland Management Programme.</li> <li>Implementation of land disturbance permits system. Preparation and distribution of awareness-raising materials and training about protection of land and natural resources.</li> <li>Regular consultation and community grievance mechanism.</li> </ul>		
Disruption to herding activities	Affected herder households	Construction Operations	<b>Duration</b> Medium-Term <b>Extent</b> Localised <b>Likelihood</b> Likely	Moderate Adverse	<ul style="list-style-type: none"> <li>Education assistance through tertiary scholarships and material and equipment support for school students.</li> <li>Application of dust management techniques and procedures.</li> <li>Participation in the Sustainable Pastureland Management Programme.</li> <li>Regular consultation and community grievance mechanism.</li> </ul>	Resettlement Action Plan Transport Management Plan Air Quality Management Plan Stakeholder Engagement Plan Community Grievance Procedure and complaints logs.	Minor Adverse
Water access restrictions or loss	Affected herder households	Construction Operations	<b>Duration</b> Short-Term <b>Extent</b> Highly Localised <b>Likelihood</b> Certain	Major Adverse	<ul style="list-style-type: none"> <li>Replacement well or equivalent to guarantee water supply.</li> <li>Monitoring of all potentially affected herder wells in vicinity of Project facilities.</li> </ul>	Resettlement Action Plan Water Resources Management Plan	Minor Adverse
Communal grazing land loss (and increase in competition for grazing)	Khanbogd <i>soum</i> herders	Construction Operations Mine Closure	<b>Duration</b> Long-Term <b>Extent</b> Widespread <b>Likelihood</b> Certain	Moderate Adverse	<ul style="list-style-type: none"> <li>Community compensation delivered in-kind, e.g. well rehabilitation, animal dips, and veterinary service, through Sustainable Pastureland Management Programme.</li> <li>Establishment of Pasture User Groups and development of pasture management plans by each Pasture User Group.</li> </ul>	Resettlement Action Plan Sustainable Pastureland Management Programme Pastureland Health Monitoring Reports for Khanbogd <i>soum</i>	Moderate Adverse

Impact	(1) Receptor	(2) Phase	(3) Impact Categorisation	(4) Potential Significance	Design and Mitigation Measures	Management Plans, Policies and Procedures	Residual Significance
					<ul style="list-style-type: none"> <li>▪ Establishment of long-term pastureland health monitoring programme in Khanbogd <i>soum</i>.</li> <li>▪ Establishment of a Rangeland Health Monitoring database for Khanbogd <i>soum</i>.</li> <li>▪ Seed collection and rehabilitation in disturbed pasture areas.</li> </ul>		

**Notes:**

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

**(2) Project Phase:** C = Construction, O = Operations, D = Decommissioning and Closure

**(3) Impact Categorisation:**

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

Extent: Highly Localised; Localised; Widespread

Likelihood: Highly Unlikely; Unlikely; Likely; Certain

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